3.3 BIOLOGICAL RESOURCES

3.3.1 Existing Conditions

Regional Overview

The influences of climate, topography, and soils combine to determine the character of the biological environment of a region. Each of these factors varies greatly throughout San Diego, resulting in a diversity of vegetation communities which include coastal wetlands, grasslands, vernal pools, sage scrub, chaparrals, riparian woodlands, oak woodlands, coniferous forests, and creosote bush scrub. The San Diego region contains habitats and species that are considered to be sensitive by state and federal agencies, affected local jurisdictions and conservation organizations. The San Diego region has been identified as a major "hot spot" for biodiversity and species endangerments. Many unique and endangered species are found only in this region.

Sensitive Resources

The biological resources documented in this section were determined through an extensive review of the most current biological literature and Geographical Information Systems (GIS) data available for the City of San Diego. Vegetation communities and sensitive plant and animal species were identified based on the regional vegetation map, prepared by the City of San Diego, which is incorporated into the Multiple Species Conservation Program (MSCP) database San Diego GIS 1995 (SANGIS 1995). General flora and fauna species were determined based on the identified vegetation communities and the species that typically occur in these habitats **(Figure 3.3-1).**

Biological Habitats and Communities

A host of upland and wetland vegetation communities, defined according to the current Holland Code (HC) classification system (Holland 1986) and San Diego County terrestrial vegetation community descriptions (Oberbauer 1996), occur within the City of San Diego. For ease of discussion, some of the habitats have been grouped under broader habitat categories that are specifically addressed within the City Land Development Manual – Biology Guidelines (as amended July, 2002). These categories are organized by habitat tiers, as specified in the City's Biology Guidelines, rather than natural habitat groupings (**Table 3.3-1**).

Table 3.3-1 Habitat Types within the City of San Diego	
UPLAND HABITATS	
	Habitat Type
Tier I: **(rare uplands)**	Southern Foredunes Torrey Pines Forest Coastal Bluff Scrub Maritime Succulent Scrub Maritime Chaparral Scrub Oak Chaparral Native Grassland Oak Woodland
Tier II: **(uncommon uplands)**	Coastal Sage Scrub (CSS) CSS/Chaparral
Tier III A: **(common uplands)**	Chaparral Mixed Chaparral Chamise Chaparral
Tier III B: **(common uplands)**	Valley and Foothill Grasslands Non-native Grasslands
Tier IV: **(other uplands)**	Urban/Developed Disturbed Agriculture Eucalyptus Woodland
WETLAND HABITATS	
Coastal	Salt Marsh Salt Panne/Mudflat
Riparian	Oak Riparian Forest Riparian Forest Riparian Woodland Riparian Scrub/Riparian Scrub in the Coastal Overlay Zone Riparian and Bottomland Habitat
Freshwater Marsh	Freshwater Seep Freshwater Marsh/Freshwater Marsh in the Coastal Overlay Zone
Disturbed Wetland	Disturbed Wetland
Unvegetated Freshwater	Non-vegetated Channel, Floodway, Lakeshore Fringe Unvegetated Habitat Freshwater
Marine Habitats	Unvegetated Habitat Estuarine Unvegetated Habitat Beach Unvegetated Habitat Marine Intertidal Unvegetated Habitat Marine Subtidal Unvegetated Habitat Shallow Bay Unvegetated Habitat Intermediate Bay

Source: Merkel & Associates, 2003

Upland Habitats

Tier I Habitats – Rare Uplands

Tier I habitats include the upland habitats that are considered to be rare within the City of San Diego. These habitats have suffered substantial historic losses on top of naturally narrow distribution patterns, such as in the case of southern foredunes and Torrey pine woodlands. Tier I habitats were once common, as was the case for native grasslands, but other historic land conversion has resulted in precipitous declines that threaten the continued persistence of the habitats in the region.

Southern Foredunes
Southern foredunes (HC 21230) are a relatively uncommon constituent of today's City beaches, but two hundred years ago were widely dispersed at the upper edge of the region's oceanic high tides where they occupied hummocky areas of sand and the interstitial swales. The most common components of this vestigial vegetation are two species of abronia (*Abronia maritima*, *A. umbellata*), beach evening primrose (*Camissonia cheiranthifolia*), and beach ambrosia (*Ambrosia bipinnatisecta*).

Torrey Pines Forest
This remnant coniferous forest habitat (HC 83140) is now restricted in the mainland United States to several stands of Torrey pines at Torrey Pines State Park and around the city of Del Mar. It appears to rely on moisture supplied by frequent fogs and is strongly correlated with marine sandstone substrate.

Coastal Bluff Scrub
Few native plants can survive on the erosive slopes of San Diego's coastal bluffs. Typically, this scrub (HC 31000) is comprised of plants that are adapted to a regime of fogs, and a generally wetter environment that is found a short distance inland, including some succulent-leaved plants such as *Coreopsis* spp. and coast pincushion flower (*Chaenactis glabriuscula* var. *orcuttiana*). Other plants are adapted to salt tolerant conditions and include species of saltbush (*Atriplex* spp.) and pineapple weed (*Chamomilla suaveolens*). This vegetation community is declining as the bluffs erode, where very disturbed weedy mesa vegetation is replacing the existing coastal bluff scrub.

Maritime Succulent Scrub
This scrub (HC 32400) is largely associated with the flora in northern Baja California. It occurs in the United States primarily in the extreme southwestern portions of San Diego County near the Mexican border. Dominant shrubs here typically include jojoba (*Simmondsia chinensis*) and flat-top buckwheat (*Eriogonum fasciculatum*). This phase of sage scrub also includes several desert elements such as four-wing saltbush *(Atriplex canescens*), waterjacket (*Lycium andersonii*), and sometimes very unusual species for western San Diego County such as smooth-stemmed fagonia *(Fagonia laevis*) and desert filaree (*Erodium texanum*).

Maritime Chaparral
This phase of coastal chaparral, southern maritime chaparral (HC 37C30) located on north-facing slopes is a vestigial remnant of the wetter and cooler Pleistocene. It generally is restricted to sandstone substrates and usually includes at least one of the following shrub species: Del Mar

manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*), Nuttall's scrub oak (*Quercus dumosa*), and/or coast white lilac (*Ceanothus verrucosus*).

Scrub Oak Chaparral
Scrub oak chaparral (HC 37900) is a dense, evergreen chaparral reaching up to 20 feet tall. The vegetation is dominated by Nuttall's scrub oak (*Quercus dumosa*), with inclusions of interior mountain-mahogany (*Cercocarpus betuloides* var. *betuloides*) and a substantial accumulation of leaf litter. This chaparral type typically occurs in more mesic (moist) locations, and often at a slightly higher elevation, than other chaparral types, thus enabling the vegetation to recover more quickly from fire.

Native Grassland
Valley needlegrass grassland (HC 42110) typically supports extensive stands of purple needlegrass (*Nasella* pulchra) as the indicator species for its presence. A limited association of herbaceous perennials and annuals are often found growing among the clumps of needlegrass – including several rare species.

Oak Woodland
Oak woodlands within the City of San Diego are dominated by coast live oak woodlands (HC 71160). These habitats are evergreen woodlands primarily dominated by coast live oak (*Quercus agrifolia*); with a relatively open and low-growing understory that supports perennial grasslands, annuals, and herbaceous perennials, as well as a mix of shrubs and sometimes-dense thickets of western poison oak. Additional characteristic flora species include California blackberry, San Diego sedge (*Carex spissa*), California coffeeberry (*Rhamnus californica*), California rose (*Rosa californica*), nodding needlegrass (*Nassella cernua*) and large clarkia (*Clarkia purpurea*).

Dense coast live oak woodland (HC 71162) is a dense phase of oak woodland characterized by a contiguous canopy of coast live oak with few additional tree or shrub components. The understory may be less diverse than that associated with a less mature phase of oak woodland.

Tier II Habitats – Uncommon Uplands

Coastal Sage Scrub
The most common native vegetation type remaining within the boundaries of the City of San Diego (MSCP Table of Vegetation Communities 1998) is Diegan coastal sage scrub (HC 32500). This phase of sage scrub is a low-lying, relatively open scrub with desert affinities, and is comprised of soft-woody, drought deciduous species that provide the majority of the vegetative cover. Characteristic flora species include California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), California encelia (*Encelia californica*), goldenbush (*Isocoma menziesii*), laurel sumac (*Malosma laurina*), foothill needlegrass (*Nassella lepida*), lemonadeberry (*Rhus integrifolia*), black sage (*Salvia mellifera*), San Diego monkeyflower (*Mimulus aurantiacus*), and California brickellbush (*Brickellia californica*).

A disturbed form of coastal sage scrub is broom baccharis scrub. This habitat supports many of the same species as Diegan sage scrub, but is typically found as a disturbance following community that is generally best developed along alluvial floodplains and within areas of sandy soils. The habitat is dominated by broom baccharis (*Baccharis sarothroides*).

Coastal Sage Scrub/Chaparral
This "hybrid" of two common vegetation types (HC 37G00) usually indicates either an area of sage scrub growing on disturbed substrates, converting into a mature chaparral vegetation; or a mature ecotone in which ecological conditions for each of these two vegetation types does not allow one habitat type to out-compete the other.

Tier IIIA Habitats – Common Uplands

Chaparral
Chaparral (HC 37200), generally including mixed chaparral and chamise chaparral as described below, typically occupies dry, rocky, and often steep north-facing slopes, and is dominated by relatively tall (between 1.5-3 meters), broad-leaved, deep rooted woody shrubs. Chaparral vegetation located on south-facing slopes is typically more open and can form a mosaic with sage scrub vegetation. Identification of shrub dominants usually allows for a more specific phase of chaparral to be identified.

> Mixed Chaparral - Southern mixed chaparral (HC 37120) is a mid-sized to tall chaparral, with limited shrub diversity in drier areas, but a floristically varied understory with numerous species of subshrubs, herbaceous perennials, bulbs and annuals in shaded and wetter areas. Characteristic flora species include mission manzanita (*Xylococcus bicolor*), Ramona ceanothus (*Ceanothus tomentosus*), San Diego mountain-mahogany (*Cercocarpus minutiflorus*), holly-leaf redberry (*Rhamnus ilicifolia*), sugar bush (*Rhus ovata*) and fuchsia-flowered gooseberry (*Ribes speciosum*).
>
> Chamise Chaparral - Chamise chaparral (HC 37200) is locally common on poorly developed soils throughout the City, and is a lower growing chaparral community dominated by chamise (*Adenostoma fasciculatum*), with comparatively limited shrub diversity and arid understory conditions.

Tier IIIB Habitats – Common Uplands

Valley and Foothill Grassland
This general vegetation category indicates there is insufficient information to more accurately identify the grassland components present (HC 42000). Included here may be areas of scattered native perennial grasses interspersed with larger stands of introduced non-native grasses. This habitat is classified as a Tier IIIB habitat for this analysis since it is highly probable that the majority of this habitat will ultimately be determined to be non-native grasslands rather than native grasslands when reviewed at the project-specific level.

Non-native Grassland
Non-native grasslands (HC 42200) are widely dispersed throughout the San Diego region. This "introduced" grassland consists of a dense to open cover of predominantly Eurasian grasses that have become widespread on disturbed or heavily grazed lands. Local grasslands are dominated by non-native grasses such as bromes (*Bromus madritensis* ssp. *rubens*, *B. hordeaceus* and *B. diandrus*) and slender wild oat (*Avena barbata*), as well as non-native forbs, such as mustard (*Hirshfeldia incana* and *Brassica nigra*), and filarees (*Erodium brachycarpum*, *E. cicutarium*, and *E. moschatum*). The quality of these grasslands is expected to coincide with the quality of the surrounding vegetation communities and land uses.

Tier IV Habitats – Other Uplands

Urban/Developed
Much of the peripheral study area (OC 12000) is comprised of residential and commercial development dominated by non-native/exotic vegetation, eucalyptus woodland, and disturbed habitats. Urban and semi-urban areas contain numerous and varied horticultural plantings located within residential yards, active-use parklands, and golf courses. In the older, urbanized portions of the City, tall exotic plantings, such as eucalyptus trees (*Eucalyptus* sp.) with allelopathic toxins that tend to inhibit understory growth, form well developed, and dense woodlands. Occasionally, other planted woodlands such as introduced pines, ash, and elm are present. Disturbed areas are typically located adjacent to urbanization and contain a mix of primarily weedy species, including non-native forbs, annuals, and grasses, usually found pioneering on recently disturbed soils. Characteristic weedy species include prickly sow thistle (*Sonchus asper*), common sow thistle (*Sonchus oleraceus*), bristly ox-tongue (*Picris echioides*), Russian thistle (*Salsola tragus*), giant reed, hottentot-fig (*Carpobrotus edulis*), wild lettuce (*Lactuca serriola*), tree tobacco (*Nicotiana glauca*), castor-bean (*Ricinus communis*), pampas grass, smooth cat's-ear (*Hypochoeris glabra*), red-stem filaree (*Erodium cicutarium*), short-beak filaree (*Erodium brachycarpum*) and white-stem filaree (*Erodium moschatum*). These urban lands do not typically contain native vegetation or provide essential habitat connectivity; and therefore, tend to have reduced biological value.

Disturbed Habitat
Disturbed habitat is another broad category of disturbed lands (OC 11300) that usually supports no vegetation, or retains only pioneering weedy species, but does not include a disproportionately strong component of non-native grasses. Such disturbed habitats may establish on recently graded or severely brushed lands.

Agriculture
Agricultural practices throughout the City are quite varied. They include orchards and vineyards, intensive agriculture such as dairies, and extensive field crop and livestock grazing agriculture.

While once a distinctive characteristic of the region in the late 1800s and early 1900s, today only small portions of the City of San Diego are still comprised of groves/orchards (OC 18100), consisting primarily of woody crops such as citrus fruits and avocados. The majority of these crops are located to the north and east of the City infrastructure -- within the foothills and along the San Pasqual Valley. Herbaceous understory growth may be planted or provide natural cover, and is typically open in density to facilitate with crop harvesting. Although groves and orchards also tend to have reduced biological value, they do provide cover for wildlife movement, as well as perch and nest sites for raptorial (relating to or characteristic of birds of prey) and passerine (perching birds and songbirds such as the jays, blackbirds, finches, warblers, and sparrow species).

Few such areas under the general agricultural heading (OC 18200) remain within the City. Where present, such as in portions of the San Pasqual Valley, habitat within the active footprint areas is usually extremely degraded and devoid of any significant biological resources.

Truck crops (OC 18300) are still occasionally planted in the extreme northern and southern portions of the City of San Diego. Typically all areas historically used for agriculture (controlled

by the owner/renter) that can be deeply disked and planted for harvest are employed for that purpose. Fallow areas of agricultural fields overwhelmingly consist of non-native weedy species. Occasionally, rare bulbs may survive in lightly disked fields that have not been regularly planted.

Eucalyptus Woodland
Eucalyptus woodland (OC 11100) is a prominent component of the City's canyon lands, but is a relatively late introduction into the region. Quite a few eucalyptus species were intentionally introduced from arid portions of Australia to provide a readily grown tree. The understory within eucalyptus woodland is often devoid of all but the most ubiquitous non-native weeds.

Botanical Resources-Flora

San Diego County has the highest floristic diversity of any county in the continental United States and the City of San Diego hosts the highest floristic diversity of any city in the county. The diversity of the City of San Diego is attributable both to the size of the City as well as the diverse array of habitats that it includes. Among the most floristically diverse regions of the City are coastal canyons that support remnants of once more common scrub communities. In a general sense, the diversity of the City's flora decreases away from the coast and to the north; such that the highest floristic diversity in the City is observed in the southwestern regions while the lowest floristic diversity is found in the northeastern portions of the City. Over the past century, the native flora of the City has been increasingly impacted. This has occurred as a result of rapidly changing land uses that have lead to the loss of much of the region's native habitat, particularly on the immediate coast and over the flat coastal plains. In addition there has been a continued degradation of the remaining natural areas by intensifying recreational pressures, alteration of fire conditions, and perhaps most importantly, the expansion of invasive exotic plant species. As a result of these historic impacts, the flora with the highest affinity for coastal environments has been tremendously diminished within the City and only remnant representatives of the original floral diversity remain along the coastal fringe and within urban canyons. Conversely, the data are too coarse to include smaller drainages that may be found via field surveys.

Zoological Resources-Fauna

The City of San Diego is located within a coastal plain largely developed with urban and agricultural uses, but still retains a network of undeveloped canyonlands. Such development now limits the extent and connectivity of the wildlife habitat; however, the identified native vegetation communities, and to some extent the non-native categories, support a number of locally common, as well as sensitive species. The following text discusses many of the faunal groups occurring within the City limits. Faunal species are discussed in a regional context; therefore, existing site-specific conditions may differ from this more generic coverage. Sensitive species are not specifically discussed in these summary sections since they are addressed in more detail later in this document.

Invertebrates

Limited cohesive information is available to provide a thorough description of the many invertebrate fauna found within the City of San Diego region; however, the range of butterfly species and vernal pool branchiopods has been fairly well documented within the City. Butterfly

species occur in a wide range of habitats; including sage scrub and chaparral, open areas devoid of substantial shrub cover such as non-native grasslands and agricultural/disturbed land, as well as more densely vegetated areas such as riparian habitat and oak woodlands. These habitats provide various host-specific plants suitable for larval development, adult nectar resources; as well as topographical features, such as hilltops or open ground that aid in courtship and mating. In contrast, vernal pool branchiopods are strongly restricted to vernal pool habitat, and consequently, many of these species are considered to be sensitive.

Fishes

Insufficient information exists to provide a complete description of the freshwater fish associations found within the City of San Diego. While fish species within the various reservoirs are fairly well known, fish occurring along the City's streams are not well documented. The only native freshwater fish species potentially present within the study area is an almost extinct race of steelhead trout (*Oncorhyhnchus mykiss*) that once spawned in some of the larger stream systems of Southern California. Within the City of San Diego, this species once occurred in such drainages as the San Diego River and Rose Creek; however, it was extirpated (exterminated) in the middle of the last century. The freshwater fish community occurring in the area's reservoirs and streams are presently believed to consist exclusively of exotic species that have been introduced at various times over the past two centuries to provide game fish and a forage base. Fish species found in the City include largemouth bass, a number of centrarchid sunfish, bluegill, black crappie, threadfin shad, several catfish, rainbow trout, carp and goldfish, several minnows, and the ubiquitous mosquitofish (*Gambusia affinis*). While most of the established fish populations are found in association with the major reservoirs and deeper ponds along perennial streams and rivers in the City, mosquitofish have been introduced in nearly every freshwater body as a biotic control of mosquitos.

Amphibians

Amphibians typically occur in riparian habitats with peripheral upland vegetation. Riparian ecosystems often provide temporary ponding water used as breeding habitat by various amphibious species, as well as abundant vegetation for cover and foraging. Amphibians will also create burrows in adjacent upland habitats, such as sage scrub and non-native grasslands, where they will aestivate (or spend time in a dormant state, similar to hibernation). Amphibian species known or with a potential to occur in the San Diego region include the garden slender salamander (*Batrachoseps major*), arboreal salamander (*Aneides lugubris*), western toad (*Bufo boreas*), California chorus frog (*Pseudacris cadaverina*), Pacific chorus frog (*Pseudacris regilla*), and the bullfrog (*Rana catesbeiana*), a non-native species. Two sensitive species, the western spadefoot toad (*Scaphiopus hammondii*) and arroyo toad (*Bufo californicus*) also occur within the City at a few locations.

Reptiles

Relatively uncommon in coastal canyons and other Environmentally Sensitive Lands (ESL) is the western whiptail lizard (*Cnemidophorus tigris*); a species more typically seen in the inland arid foothill region. In contrast, the sensitive orangethroat whiptail (*Cnemidophorus hyperythrus*), which has a sporadic but widespread range in coastal San Diego County, is locally common within areas of native vegetation, including peripheral wetlands habitat. Western fence

lizards (*Sceloporus occidentalis*) and side-blotched lizards (*Uta stansburiana*) are common to abundant in open areas throughout the City's canyons. Southern alligator lizards (*Elgaria multicarinata*) are regularly found in ecotonal habitat on the periphery of residential areas. Expected to occur occasionally in open, sandy habitat in areas of sage scrub is the coast horned lizard (*Phrynosoma coronatum blainvillei*). This lizard needs an abundant supply of ants as a food source, and is heavily predated upon by feral cats and pet collecting children.

Western pond turtle *(Clemmys marmorata)* are known to occur in many stock ponds and riverine pools within the City's canyon, but are now extirpated from most of their natural habitats. The pond slider (*Chrysemys scripta*) is an introduced species that is also found regionally. This large aquatic turtle is native to the eastern United States and various areas of Mexico.

The western rattlesnake (*Crotalus viridis helleri*) is commonly found within the canyons of the City and is most often encountered along the riparian fringe of urban canyons. During the summer months, this species often moves up to irrigated yards along canyon crests where it is often killed. While regionally common, this snake is being depleted in more urbanized areas. The larger ponds and marsh areas along the major rivers are particularly suitable to the requirements of the two-striped aquatic garter snake (*Thamnophis hammondii*). This species has been historically observed in many of these wetlands regionally.

Common reptiles such as the gopher snake (*Pituophis melanoleucus*), the coachwhip (*Masticophis flagellum*), the California striped racer (*Masticophis lateralis*), and common kingsnake (*Lampropeltis getulus*) occur within many of the region's canyons. Herpetologist Lawrence Klauber's field notes (unpublished/undated) from the first half of the 20th century include a variety of canyon sightings for now locally uncommon or infrequently observed species such as the glossy snake (*Arizona elegans*), the ringneck snake (*Diadophis punctatus*), the night snake (*Hypsiglens torquata*), and the long-nosed snake (*Rhinocheilus lecontei*). These species are likely depleted from the levels noted by Klauber.

Numerous species of lizards and snakes use rock crevices for cover within sage scrub and open chaparral habitat, and feed on small insects and insect larvae among the leaf litter. Other species are found in grasslands and agricultural/disturbed land, or in riparian areas and hunt small rodents. Quality reptilian habitat, primarily consisting of sage scrub, rocky outcrops, chaparral and oak woodland, is still located at many canyon sites; however, the small patch size available for various species makes local population extirpations increasingly more difficult to deter.

Birds

Over four hundred species of birds have been reported within the environs of the City of San Diego, supporting some of the highest avian diversity in the United States. Both yellow-breasted chats (*Icteria virens*) and yellow warbler (*Dendroica petechia*) also nest locally in this habitat. Also noteworthy due to its sensitive status is the California gnatcatcher (*Polioptila californica*). There are many historical sightings of this gnatcatcher in open space, privately owned lands and on other sensitive lands.

A number of common birds, which nest in riparian woodland or adjacent sage scrub uplands in San Diego County, are known to nest in the City's canyons and other ESL. These include the Anna's hummingbird (*Calypte anna*), black-chinned hummingbird (*Archilochus alexandri*),

mourning dove (*Zenaida macroura*), great horned owl (*Bubo virginianus*), burrowing owl (*Athene cunicularia*), black phoebe (*Sayornis saya*), cliff swallow (*Hirundo pyrrhonota*), common raven (*Corvus corax*), bushtit (*Psaltriparus minimus*), house finch (*Carpodacus mexicana*), black-headed grosbeak (*Pheucticus melanocephalus*), spotted towhee (*Pipilo maculatus*), California towhee (*Pipilo crissalis*), red-winged blackbird (*Agelaius phoeniceus*), tricolored blackbird (*Agelaius tricolor*), phainopepla (*Phainopepla nitens*), ash-throated flycatcher (*Myiarchus cinerascens*), orange-crowned warbler (*Vermivora celata*), common yellowthroat (*Geothlypis trichas*), song sparrow (*Melospiza melodia*), hooded oriole (*Icterus cucullatus*), northern oriole (*Icterus galbula*), lesser goldfinch (*Carduelis psaltria*), and American goldfinch (*Carduelis tristis*). Many other birds, primarily migrants and winter visitors, use the riparian trees as they pass though the coastal lowlands to and from their breeding grounds to the north and south. Migrant songbirds from the Emberizidae family found in spring include Nashville warbler (*Vermivora ruficapilla*), black-throated gray warbler (*Dendroica nigrescens*), hermit warbler (*Dendroica occidentalis*), Townsend's warbler (*Dendroica townsendi*), MacGillivray's warbler (*Oporornis tolmiei*), and Wilson's warbler (*Wilsonia pusilla*).

Some species of waterfowl more typically found in large bays and ponds occur seasonally and sporadically in coastal canyon wetlands and on the City's reservoirs. These include lesser scaup (*Aythya affinis*), bufflehead (*Bucephala albeola*), northern pintail (*Anas acuta*), ruddy duck (*Oxyura jamaicensis*), eared grebe (*Podiceps nigricollis*), Clark's grebe (*Aechmophorus clarki*), western grebe (*Aechmophorus occidentalis*), northern shoveler (*Anas clypeata*), canvasback (*Aythya valisineria*), and redhead (*Aythya americana*). Other species detected that are often associated with freshwater marshes and ponds include pied-billed grebe (*Podilymbus podiceps*), green-winged teal (*Anas crecca*), cinnamon teal (*Anas cyanoptera*), sora rail (*Porzana carolina*), common moorhen (*Gallinula chloropus*), and American coot (*Fulica americana*).

Some avian species such as the greater roadrunner (*Geococcyx californianus*) are now rarely observed in the City open space. These large ground-dwelling cuckoos are becoming less and less common in coastal Southern California as their open scrubland habitat is developed.

Numerous birds of prey still regularly use open space for hunting. These include white-tailed kite (*Elanus leucurus*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), sharp-shinned hawks (*Accipiter striatus*), merlin (*Falco columbarius*), golden eagle (*Aquila chrysaetos*), peregrine falcon (*Falco peregrinus*), Cooper's hawk (*Accipiter cooperii*), American kestrel (*Falco sparverius*), and red-shouldered hawk (*Buteo lineatus*).

Native and non-native vegetation communities provide habitat for numerous species of resident and migratory birds. A number of common avian species breed within sage scrub and chaparral habitats, and forage among the leaf litter in the vegetative understory. Rocky outcrops, particularly on undisturbed slopes or peaks can provide significant perching or roosting sites for raptors; and grasslands and agricultural lands located adjacent to woodland areas provide significant foraging habitat for resident, wintering and migrant raptors. Avian diversity and abundance is substantial within riparian and oak woodland habitats. These habitats are comprised of several horizontal niches including canopy, shrub, herb, and ground, which provide a network of valuable roosting, foraging and breeding areas for birds. Quality avian habitat within the City of San Diego is concentrated where the vegetation is less disturbed and provides habitat connectivity; however, the various creeks and tributaries within the City of San Diego also provide some measure of habitat connectivity, and potential avian breeding and foraging areas.

Mammals

Without trapping, the presence of mammal species must be discerned through habitat suitability, species range and biological records. Many mammals are nocturnal and secretive, and indirect signs for a number of species, particularly rodents, can be similar. Small mammal species typically occur in sage scrub, chaparral, grasslands and agricultural/disturbed areas, and several of these species will intermittently use riparian and woodland habitats for foraging and cover. Various species of bats will also forage in grasslands and woodland habitats. Larger mammals often require greater blocks of connected habitat for hunting and travel within their range. Quality habitat for small mammal species is generally located throughout the study area, but as with reptiles, small remaining patch size can undercut the ability of some species populations to survive in open space.

Despite the extensive urban development within the City core, a number of regionally common mammals still reside within City open space and other now often isolated pockets of remaining native vegetation. Included are coyote, desert cottontail, California ground squirrel, Virginia opossum, and striped skunk.

Threatened, Endangered, Endemic and Sensitive or MSCP Covered Species

Sensitive Flora

Table 3.3-2 summarizes the sensitive plant species that could be affected by the proposed Programs. Sensitive plants include those listed by United States Fish Wildlife Service (USFWS) (1999), CDFG (2002), the California Native Plant Society (CNPS) (Smith and Berg 1988), and Narrow Endemic Species (City of San Diego 2001). The following abbreviations are used in the table: FE = Federally Endangered, FT = Federally Threatened, FSC = Federal Species of Special Concern, SE = State Endangered, SR=State Rare, NE = Narrow Endemic Species; habitat codes are synonymous to those used in the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik 1994), including CCFrs = closed-cone conifer forest, Chprl = chaparral, CoScr = coastal scrub, CmWld = cismontane woodland, MshSw = marshes and swamps, Medws = meadows and seeps, RpWld = riparian woodland, VFGrs = valley and foothill grassland.

Table 3.3-2
Local Special Status Plant Species Potential Presence and Status

Scientific Name	Common Name	Habitat	Federal Status	California Status	CNPS List	MSCP Covered
Acanthomintha ilicifolia	San Diego thorn-mint	Chprl, CoScr, VFGrs, /clay	FT	SE	1B	Covered NE
Adolphia californica	California adolphia	Chprl, CoScr	None	None	2	Not Covered
Agave shawii	Shaw's agave	CoScr	None	None	2	Covered NE
Ambrosia pumila	San Diego ambrosia	CoScr,RpWld	FE	None	1B	Covered NE
Aphanisma blitoides	aphanisma	CoScr	None	None	1B	Covered NE
Arctostaphylos glandulosa ssp. crassifolia	Del Mar manzinita	Chprl	FE	None	1B	Covered
Arctostaphylos otayensis	Otay manzinita	Chprl	FE	None	1B	Covered
Astragalus deanei	Dean's milk-vetch	CoScr, Chrpl	None	None	1B	Covered
Astragalus tener var. titi	coastal dunes milk-vetch	Dunes	FE	SE	1B	Covered NE
Baccharis vanessae	Encinitas baccharis	Chprl (sandstone)	FT	SE	1B	Covered NE
Bergerocactus emoryi	goldenspined cereus	CoScr, Chprl	None	None	2	Not Covered
Brodiaea orcutti	Orcutt's brodiaea	CCFrs, Chprl, CmWld, Medws, VFGrs, clay	None	None	1B	Covered
Calamagrostis koelerioides	dense reed grass	Chprl	None	None	None	Covered
Calochortus dunnii	Dunn's mariposa lily	Chprl	None	SR	1B	Covered
Caulanthus stenocarpus	slender pod jewelflower	Chprl, CoScr	None	SR	None	Covered
Ceanothus cyaneus	lakeside ceanothus	Chprl	None	None	1B	Covered
Ceanothus verrucosus	wart-stemmed ceanothus	Chprl	FSC	None	2	Covered
Centromadia pungens ssp. *laevis*	smooth tarplant	VFGrs	None	None	1B	Not covered
Chamaebatia australis	southern mountain misery	Chprl	None	None	4	Not covered
Chorizanthe orcuttiana	Orcutt's spineflower	CoScr	FE	SE	1B	Covered
Comarostaphylis diversifolia ssp. *diversifolia*	summer-holly	Chprl	None	None	1B	Not Covered

Table 3.3-2
Local Special Status Plant Species Potential Presence and Status

Scientific Name	Common Name	Habitat	Federal Status	California Status	CNPS List	MSCP Covered
Convolvulus simulans	small-flowered morning glory	Chprl (openings)	None	None	4	Not covered
Cordylanthus orcuttianus	Orcutt's bird's-beak	CoScr	None	None	2	Covered
Corethrogyne filaginifolia var. incana	Point Loma sand aster	Chprl	None	None	1B	Not Covered
Corethrogyne filaginifolia var. linifolia	Del Mar sand aster	CoScr, Chprl, VFGrs	None	None	1B	Covered
Deinandra conjugens	Otay tarplant	VFGrs	FT	SE	1B	Covered NE
Dichondra occidentalis	western dichondra	Chprl, CoScr	None	None	4	Not covered
Dudleya blochmaniae ssp. blochmaniae	Blochman's dudleya	CoScr	FSC	SE	1B	Covered NE
Dudleya variegata	variegated dudleya	CoScr	None	None	1B	Covered NE
Dudleya viscida	sticky dudleya	Chprl, CoScr (steep north facing slopes)	None	None	4	Covered
Euphorbia misera	cliff spurge	CoScr	None	None	2	Not covered
Ferocactus viridescens	San Diego barrel cactus	Chprl, CoScr	FSC	None	2	Covered
Fritillaria biflora var. *biflora*	chocolate lily	Chprl, CoScr, VFGrs/clay	None	None	Unlisted	Not covered
Githopsis diffusa ssp. *filicaulis*	mission canyon blue-cup	Chprl (openings)	None	None	3	Not covered
Harpagonella palmeri	Palmer's grappling hook	Chprl, CoScr, VFGrs/clay	None	None	4	Not covered
Hazardia orcuttii	Orcutt's hazardia	Chprl	None	Candidate	1B	Not covered
Holocarpha virgata	graceful tarplant	VFGrs	None	None	4	Not covered
Horkelia truncata	Ramona horkelia	Chprl, CmWld/ clay	None	None	1B	Not covered
Isocoma menzeisii var. *decumbens*	decumbent goldenbush	CoScrs	None	None	1b	Not covered
Lepechinia cardiophylla	Gander's pitcher sage	Chprl	None	None	1B	Covered
Machaeranthera juncea	rush-like bristleweed	Chprl, CoScr	None	None	4	Not covered
Microseris douglasii	small-flowered microseris	VFGrs (clay)	None	None	4	Not Covered
Monardella hypoleuca ssp. lanata	felt-leaved monardella	Chprl	None	None	1B	Covered
Muilla clevelandii	San Diego goldenstar	Chprl, CoScr (openings)	None	None	1B	Covered

Table 3.3-2
Local Special Status Plant Species Potential Presence and Status

Scientific Name	Common Name	Habitat	Federal Status	California Status	CNPS List	MSCP Covered
Nolina interrata	Dehesa bear-grass	Chprl	None	SE	1B	Covered
Opuntia californica var. californica	snake cholla	CoScr	None	None	1B	Covered NE
Phacelia stellaris	Brand's phacelia	CoScr, Dunes	None	None	1B	Not Covered
Pinus torreyana	Torrey pine	Coniferous Forest	None	None	1B	Covered
Polygala cornuta ssp. *fishiae*	Fish's milkwort	Chprl, CmWld, RpWld	None	None	4	Not covered
Quercus dumosa	Nuttall's scrub oak	Chprl	None	None	1B	Not covered
Quercus engelmanni	Engelmann oak	Chprl, CmWld, RpWld, VFGrs	None	None	4	Not covered
Rosa minutiflora	small-leaved rose	CoScr, Chprl	None	SE	2	Covered
Satureja chandleri	San Miguel savory	Chprl	None	None	1B	Covered
Senecio ganderi	Gander's butterweed	Chprl	None	SR	1B	Covered
Solanum tenuilobatum	narrow-leaved nightshade	Chprl	None	None	None	Covered
Viguiera laciniata	San Diego County viguiera	CoScr	None	None	4	Not covered

Source: Merkel & Associates, 2002

Sensitive Fauna

Table 3.3-3 summarizes the sensitive fauna species that could be affected by the proposed work. Sensitive animals include those listed by USFWS (1999) and CDFG (2002). The following abbreviations are used in the table: FE = Federally Endangered, FT = Federally Threatened, FSC = Federal Species of Special Concern, SE = State Endangered, SR = State Rare, ; habitat codes are synonymous to those used in the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik 1994), including CCFrs = closed-cone conifer forest, Chprl = chaparral, CoScr = coastal scrub, CmWld = cismontane woodland, MshSw = marshes and swamps, Medws = meadows and seeps, RpWld = riparian woodland, and VFGrs = valley and foothill grassland.

Table 3.3-3
Local Special Status Animal Species Potential Presence and Status

Scientific Name	Common Name	Habitat	Federal Status	California Status	MSCP Covered
Euphydryas editha quino	Quino checkerspot butterfly	Open grassland and openings within shrub habitats that support Dwarf Plantain (*Plantago erecta*)	FE	SA	None
Lycaena hermes	Hermes copper	Openings in chaparral, associated with the larval host plant Spiny Redberry (*Rhamnus crocea*), adults feed on nectar from Flat-top Buckwheat	FSC	SA	None
Danaus plexippus	monarch butterfly	Migratory concentrations found on trees	None	None	None
Bufo californicus	southwestern arroyo toad	Shallow pools, open sand, and gravel flood terraces of intermittent to perennial streams; may also occupy adjacent upland communities within 1.2 km	FE	CSC, Protected	Covered
Scaphiopus hammondii	western spadefoot toad	Prefers sandy or gravelly soil in grasslands, sage scrub, open chaparral, and pine-oak woodlands; grasslands with shallow temporary pools are optimal	FSC	CSC, Protected	None
Phrynosoma coronatum blainvillii	San Diego horned lizard	Chaparral, sage scrub, oak woodlands, and grasslands; sometimes occurs along seldom used dirt paths where native ant species are prevalent	FSC	CSC, Protected	Covered
Eumeces skiltonianus interparietalis	Coronado skink	Variety of habitats including grasslands, sage scrub, and various woodlands including oak, pine, juniper, and riparian	FSC	CSC	None
Cnemidophorus hyperythrus	orangethroat whiptail	Sage scrub (and chaparral), prefers sandy areas with patches of brush and rocks; may be associated with buckwheat and Black Sage	FSC	CSC, Protected	Covered
Anniela pulchra pulchra	silvery legless lizard	Shows a preference for leaf litter and sandy substrates	FSC	CSC	Not covered
Cnemidophorus tigris multiscutatus	coastal western whiptail	Coastal sage scrub, chaparral, and grasslands	FSC	SA	None
Salvadora hexalepis virgultea	coast patch-nosed snake	Chaparral and sage scrub; may require mammal burrows or woodrat nests for overwintering	FSC	CSC, Protected	None
Diadophis punctatus similis	San Diego ringneck snake	Chaparral, forest, and grasslands	None	SA	None
Lichanura trivirgata roseofusca	coastal rosy boa	Rocky outcrop areas within chaparral and sage scrub	FSC	SA	None
Crotalus ruber ruber	northern red diamond rattlesnake	Occupies rocky outcrops and areas of heavy brush or rugged terrain in chaparral, sage scrub, or desert scrub on both coastal and desert slopes, usually below 4000 feet	FSC	CSC	None
Cathartes aura	turkey vulture	Open habitats with protected large trees and snags	FSC	CSC	None

Table 3.3-3
Local Special Status Animal Species Potential Presence and Status

Scientific Name	Common Name	Habitat	Federal Status	California Status	MSCP Covered
Elanus leucurus	white-tailed kite	Grasslands, agricultural fields, and open habitats with areas of dense deciduous trees for nesting	None	SA, Fully Protected	None
Aquila chrysaetos	golden eagle	Nests in cliffs (or trees), found in generally mountainous or hilly terrain	None	CSC, Fully Protected	Covered
Falco peregrinus anatum	American peregrine falcon	Forages near coast	FE	CE	Covered
Accipiter striatus	sharp-shinned hawk	Mixed woodlands near open areas, prefers but not restricted to riparian habitats	None	CSC	None
Circus cyaneus	northern harrier	Forages over marsh and open terrain	None	CSC	Covered
Buteo regalis	ferruginous hawk	Dry, open terrain	FSC	CSC	Covered
Lanius ludovicianus	loggerhead shrike	Found within grassland or open habitats with bare ground and sparse shrub and/or tree cover for nesting and perching	FSC	CSC	None
Eremophila alpestris actia	California horned lark	Grasslands, disturbed areas and open habitats with sparse, low vegetation	None	CSC	None
Speotyto cunicularia hypugaea	burrowing owl	Hunts open terrain generally with burrow at a slight elevational rise	None	CSC	Covered
Polioptila californica californica	California gnatcatcher	Various successional stages of sage scrub	FT	CSC	Covered
Sialia mexicana	western bluebird	Open woodlands, farmlands, and orchards	None	None	Covered
Campylorhynch-us brunneicapillus cousei	coastal cactus wren	Areas of sage scrub with robust stands of prickly pear and cholla	None	CSC	Covered
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	Rocky hillsides supporting sparse, low scrub or chaparral, sometimes mixed with grasses	FSC	CSC	Covered
Amphispiza belli belli	Bell's sage sparrow	Chaparral and dense sage scrub	FSC	CSC	None
Ammodramus savannarum	grasshopper sparrow	Grasslands and pastures	None	SA	None
Felis concolor	mountain lion	Found in areas of extensive dense native vegetation	None	Calif. Regulated	Covered
Odocoileus hemionus fuliginata	southern mule deer	Found in areas of extensive dense native vegetation	None	Calif. Regulated	Covered
Taxidea taxus	American badger	Found in open grasslands on periphery of native vegetation	None	None	Covered
Lepus californicus bennettii	San Diego black-tailed jackrabbit	Relatively open chaparral and sage scrub and grasslands	FSC	CSC	None
Perognathus longimembris pacificus	Dulzura California pocket mouse	Found in areas of fine sandy ground, (Coastal sage scrub)	FSC	CSC	None

Table 3.3-3
Local Special Status Animal Species Potential Presence and Status

Scientific Name	Common Name	Habitat	Federal Status	California Status	MSCP Covered
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	Found in Coastal sage scrub	FSC	CSC	None
Neotoma lepida intermedia	San Diego desert woodrat	Chaparral, particularly abundant in areas of rock outcrops	FSC	CSC	None
Myotis yumanensis	Yuma myotis	Uses multiple habitats (primarily woodlands and forests) but forages over water	FSC	CSC	None
Myotis evotis	long-eared myotis	Uses multiple habitats for roosting (mainly crevices), forages in oak/coniferous forests, and may require water. As with many bat species in the region, little information is available on microhabitat use	FSC	None	None
Myotis thysanodes	fringed myotis	Uses multiple habitats for roosting (mainly crevices), feeds in coniferous forests	FSC	None	None
Myotis volans	long-legged myotis	Uses multiple habitats for roosting (mainly crevices), feeds in coniferous forests	FSC	None	None
Myotis ciliolabrum	small-footed myotis	Uses a variety of habitats, prefers open stands in forests/woodlands, brushy habitats, and riparian areas	FSC	None	None
Euderma maculatum	spotted bat	Roosts in high rocky cliffs, forages in riparian and edge habitats	FSC	CSC	None
Corynorhinus townsendii	Townsend's big-eared bat	Cave rooster, feeds in forest/woodland habitats or along habitat edges within 15 km of roost site	FSC	CSC	None
Antrozous pallidus	pallid bat	Uses open forest and grassland habitats for feeding and multiple habitats for roosting	None	CSC	None
Nyctinomops femorosaccus	pocketed free-tailed bat	Cliff rooster, feeds in multiple habitats	None	CSC	None
Nyctinomops macrotis	big free-tailed bat	Cliff rooster, prefers rugged, rocky canyons, feeds in multiple habitats including over water	None	CSC	None
Eumops perotis	western mastiff bat (see California mastiff bat in text)	Extensive open areas with abundant roost locations in rock outcrops, (found where oaks and chaparral occur)	FSC	CSC	None

Source: Merkel & Associates, *Biological Resources Report*, City of San Diego Canyon Sewer Program Environmental Impact Report (PEIR), 2003

Wildlife Corridors

A wildlife corridor is considered to represent linear landscape features that allow animal movement between two patches of more substantial habitat. A corridor is not expected to provide sufficient space and resources to meet all of the life history needs of its target species.

Depending upon the species considered, corridors function in a variety of ways and may function differently over the course of a year. For the purposes of general discussion, wildlife corridors can be broken down into three categories: regional corridors, local corridors, and short corridors.

Regional Corridors accommodate the needs of a broad suite of animals. Such corridors are especially important to dispersing individuals (i.e., juveniles) that use these corridors to find unoccupied ranges and mates. This effectively links otherwise distinct populations of animals and serves to maintain genetic diversity. In regional planning, attention often focuses on large, wide-ranging "umbrella" species. Under this concept, if a preserve plan can accommodate the needs of wide-ranging species, it will allow sufficient connectivity to meet the lesser needs of other species.

A typical width of greater than 1,000 feet is recommended for regional corridors serving large mammals (Ogden 1992). Constricted sections of the corridor should have maximum lengths of less than 500 feet and minimum widths of 400 feet. Where possible, canyon corridors should extend from rim to rim (Ogden 1992, 1998). For planning purposes, widths of a 2:1 proportion (length to width) are generally considered to be necessary for wildlife corridors on an average basis to provide essential buffering of wildlife activities. Narrower or wider corridors may also function depending upon the particular physiography, adjacent land uses, and corridor lengths. Spencer and Mock (1997) noted the value of transmission easements as potential contributors to meeting corridor needs in urbanized environments. Where corridors are narrow and already tenuous, special management measures are required including implementing measures to control runoff, noise, lighting, exotic predators and invasive plants. Such measures have been adopted as the Multi-Habitat Planning Area (MHPA) Land Use Adjacency Guidelines.

Local corridors are much shorter than regional corridors and permit movement between discreet vegetation patches, thereby forming "habitat linkages." These corridors allow two or more small connected patches of habitat to function as a larger block of habitat. The larger interconnected block enables viability and promotes population stability through regular genetic interchange, even though each individual habitat patch may be too small for the long-term survival of a wildlife population. To serve effectively as wildlife corridors, habitat linkages must permit unobstructed movement of the species. This becomes an important consideration with respect to connectivity between preserve areas, particularly where additional urban development is to occur on a limited basis. Depending upon the particular parameters of the linkage, connectivity may also be made by utility corridors and recreational trail facilities. Local corridors are generally considered to require widths of 400 to 600 feet to function for wildlife movement, depending upon the corridor lengths, species using the corridor, cover, topography, as well as adjacent land uses (Odgen 1998).

Short corridors function like their larger counterparts, but typically serve the daily needs of individuals. These corridors allow animals to move through unsuitable habitat to access bedding sites, watering sites, and foraging areas. Because of their frequent and regular use, such areas of concentrated wildlife movement are often referred to as "travel routes."

Wetlands

The definition of wetlands in the City's ESL Regulation is intended to differentiate uplands (terrestrial areas) from wetlands, and furthermore to differentiate naturally occurring wetland areas from those created by human activities. Except for areas created for the purposes of wetland habitat or resulting from human actions to create open waters or from the alteration of natural stream courses, it is not the intent of the City to regulate artificially created wetlands in historically non-wetland areas unless they have been delineated as wetlands by the Army Corps of Engineers, and/or the California Department of Fish and Game (CDFG). For the purposes of the ESL, artificially created lakes such as Lake Hodges, artificially channeled floodways such as the Carmel Valley Restoration and Enhancement Project (CVREP) and previously dredged tidal areas such as Mission Bay should be considered wetlands under the ESL regulations. The following provides guidance for defining wetlands regulated by the City of San Diego under the Land Development Code.

Naturally occurring wetland vegetation communities are typically characteristic of wetland areas. Examples of wetland vegetation communities include saltmarsh, brackish marsh, freshwater marsh, riparian forest, oak riparian forest, riparian woodland, riparian scrub and vernal pools. Common to all wetland vegetation communities is the predominance of hydrophytic plant species (plants adapted for life in anaerobic soils). Many references are available to help identify and classify wetland vegetation communities; Holland (1986), Cowardin et al. (1979), Keeler-Wolf and Sawyer (1996), and Zedler (1987). The United States Army Corps of Engineers (ACOE) Wetland Delineation Manual (1987) provides technical information on hydrophytic species.

Problem areas can occur when delineating wetlands due to previous human activities or naturally occurring events. Areas lacking naturally occurring wetland vegetation communities are still considered wetlands if hydric soil or wetland hydrology is present and past human activities have occurred to remove the historic vegetation (e.g., agricultural grading in floodways, dirt roads bisecting vernal pools, channelized streambeds), or catastrophic or recurring natural events preclude the establishment of wetland vegetation (e.g., areas of scour within streambeds, coastal mudflats and salt pannes that are unvegetated due to tidal duration). The ACOE Wetland Delineation Manual (1987) provides technical information on hydric soils and wetland hydrology.

Seasonal drainage patterns that are sufficient enough to etch the landscape (i.e., ephemeral/ intermittent drainages) may not be sufficient enough to support wetland dependent vegetation. These types of drainages would not satisfy the City's wetland definition unless wetland dependent vegetation is either present in the drainage or lacking due to past human activities. Seasonal drainage patterns may constitute "waters of the United States" which are regulated by the ACOE and/or the CDFG.

Areas lacking wetland vegetation communities, hydric soils and wetland hydrology due to non-permitted filling of previously existing wetlands will be considered a wetland under the ESL and regulated accordingly. The removal of the fill and restoration of the wetland may be required as a condition of project approval.

Areas that contain wetland vegetation, soils or hydrology created by human activities in historically non-wetland areas do not qualify as wetlands under this definition unless they have been delineated as wetlands by the ACOE, and/or the CDFG. Artificially created wetlands consist of the following: wetland vegetation growing in brow ditches and similar drainage structures outside of natural drainage courses, wastewater treatment ponds, stock watering, desiltation and retention basins, water ponding on landfill surfaces, road ruts created by vehicles and artificially irrigated areas which would revert to uplands if the irrigation ceased. Areas of historic wetlands can be assessed using historic aerial photographs, existing environmental reports (EIRs, biology surveys, etc.), and other collateral material such as soil surveys.

Some coastal wetlands, vernal pools and riparian areas have been previously mapped. The maps, labeled C-713 and C-740 are available to aid in the identification of wetlands. Additionally, the 1":2000' scale MSCP vegetation maps may also be used as a general reference, as well as the USFWS National Wetlands Inventory maps. These maps, located at the Development Services Department, should not replace site-specific field mapping.

3.3.2 Thresholds of Significance

A significant impact could occur if implementation of the General Plan:

- ~~Results in the reduction in the number of any unique, rare, endangered, sensitive, or fully protected species of plants or animals.~~

- ~~Results in significant impacts to important habitat or result in interference with the movements of resident or migratory fish or wildlife species.~~

- ~~Affects the long-term conservation of biological resources by allowing encroachment by urban development into any defined comprehensive resource planning area (e.g., MHPA).~~

- ~~Results in a substantial adverse impact on wetlands (including, but not limited to, marsh, vernal pool, riparian, etc.) through direct removal, filling, hydrological interruption, or other means.~~

- ~~Results in a conflict with any local policies or ordinances protecting biological resources.~~

- ~~Results in noise impacts on sensitive species.~~

1. A substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in the MSCP or other local or regional plans, policies or regulations, or by the California Department of Fish and Game (CDFG) or U.S. Fish and Wildlife Service (USFWS)?

2. A substantial adverse impact on any Tier I Habitats, Tier II Habitats, Tier IIIA Habitats, or Tier IIIB Habitats as identified in the Biology Guidelines of the Land Development manual or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFG or USFWS?

3. A substantial adverse impact on wetlands (including, but not limited to, marsh, vernal pool, riparian, etc.) through direct removal, filling, hydrological interruption, or other means?

4. Interfering substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, including linkages identified in the MSCP Plan, or impede the use of native wildlife nursery sites?

5. A conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan, either within the MSCP plan area or in the surrounding region?

6. Introducing land use within an area adjacent to the MHPA that would result in adverse edge effects?

7. A conflict with any local policies or ordinances protecting biological resources?

8. An introduction of invasive species of plants into a natural open space area?

3.3.3 Impact Analysis

The proposed Draft General Plan would result in infill and redevelopment of areas with existing development; the proposal is expected to intensify or change the land use mix in developed areas that meet village locational criteria. The proposed resultant intensification within selected urbanized areas may lessen development pressures on dwindling vacant and/or sensitive areas. The proposal is expected to initially affect older urban and suburban areas where redevelopment is more desirable and/or feasible. Over time, as additional developed areas of the City age and become suitable for redevelopment, the proposal would influence newer suburban and master planned communities.

The proposed Project would also guide the development of remaining developable vacant land. Areas that meet village location criteria would be expected to develop as mixed use, compact villages. In addition, the proposal was designed to avoid adjacency concerns with the City's planned habitat preserve, the MHPA **(Figure 3.3-2)**.

No specific projects or actions have been identified with this proposal that would result in any direct or indirect physical change in the environment. However, future growth is anticipated and may occur on undeveloped land which may result in impacts to biological resources. Therefore, for the purposes of this impact analysis, it is assumed impacts to biological resources may occur with future actions, such as community plan updates or amendments or individual project development proposals, and potential mitigation measures consistent with the City's Biology Guidelines, MSCP and ESL have been identified under **Table 3.3-4**.

Future environmental analysis would be required for any discretionary actions needed to implement the Draft General Plan. As discussed above, such proposals may result in significant impacts to biological resources and, as such, would require identification of project-specific mitigation measures at that time consistent with the City's Biology Guidelines and MSCP and ESL Regulations.

Could implementation of the Draft General Plan result in the reduction in the number of any unique, rare, endangered, sensitive, or fully protected species of plants or animals?

By focusing on compact, more environmentally sensitive development patterns, impacts to native habitat and wildlife, and habitat fragmentation and isolation within the San Diego region would generally be less than without implementation of the Draft General Plan. Fewer impacts to native habitat and wildlife would aid in the maintenance of fish and wildlife populations, and assist in maintaining the number or range of rare or endangered plants or animals.

The following are policies that have been identified within the proposed Conservation Element would be consistent with the overarching MSCP goal to maintain and enhance biological diversity in the region and conserve viable populations of endangered, threatened, and key sensitive species and their habitats, while enabling economic growth in the region:

- Pursue funding for the acquisition and management of the MHPA and other important community open space lands.
- Support the preservation of rural lands and open spaces throughout the region.
- Protect community urban canyons and other important open spaces that have been designated in community plans for the many conservation benefits they offer locally, and regionally as part of a collective citywide open space system.
- Minimize or avoid impact to canyons and other ESL, by relocating sewer infrastructure out of these areas where possible, minimizing construction of new sewer access roads into these areas, and redirection of sewage discharge away from canyons and other ESL.
- Encourage the removal of invasive plant species and the planting of native plants near open space preserves.
- Pursue formal dedication of existing and future open space areas throughout the City especially in core biological resource areas of the City's adopted MSCP Subarea Plan.
- Require sensitive deign, construction, relocation, and maintenance of trails to optimize public access and resource conservation.
- Apply the appropriate zoning and ESL regulations to limit development of floodplains, sensitive biological areas including wetlands, steep hillsides, canyons and coastal lands.
- Manage watersheds and regulate floodplains to reduce disruption of natural systems, including the flow of sand to the beaches.

- Limit grading and alternations of steep hillsides, cliffs and shoreline to minimize erosion and landform impacts.

- Limit and control runoff, sedimentation, and erosion both during and after construction activity.

The proposed policies of the Draft General Plan represent a shift in focus from development of vacant land to directing growth primarily toward village centers in order to preserve established residential neighborhoods and manage the City's growth over the long term. Additionally, development would be targeted for areas outside the MHPA and conservation priority would be given towards areas within the MHPA. Development up to 25 percent of the total parcel acreage is allowed within the City's MHPA. However, development which proposes over 25 percent encroachment into the MHPA must propose a MHPA boundary line adjustment where lands of equal or greater habitat value are added to the MHPA. The proposed boundary line adjustment must be approved by City MSCP, CDFG, and USFWS.

Future growth would still occur, and in some cases, development would occur on vacant land which may result in significant impacts to biological resources. Although this impact is expected to be less than if the Draft General Plan was not adopted, it would nevertheless still be significant, because future impacts to native habitat could result in a reduction of the number or restrict the range of a rare or endangered plant or animal. Future environmental analysis would be required for any discretionary actions needed to implement the General Plan Update (such as community plan updates or amendments or individual project development proposals). Mitigation measures~~, Bio-1 through Bio-9~~ listed below which are consistent with the City's Biology Guidelines, MSCP and ESL would be applied to all future projects, as appropriate. Since no specific projects have been identified, it is infeasible at this time to provide mitigation to a level that would result in no net loss of endangered or threatened species. Therefore, these impacts are considered to be significant and unavoidable at this program level of review.

Could implementation of the Draft General Plan result in significant impacts to important habitat or result in interference with the movements of resident or migratory fish or wildlife species?

By focusing on compact, more environmentally sensitive development patterns, impacts to native habitat and wildlife, habitat fragmentation and isolation would be reduced. These impacts would be further reduced if future development is directed towards urban infill and redevelopment consistent with the proposed policies and goals of the Draft General Plan. However, future growth would still occur, and in some cases, development would occur on vacant land which may result in significant impacts to biological resources.

On March 18, 1997, the San Diego City Council unanimously adopted the MSCP (R-28455) and in July 1997 entered into a 50-year MSCP Implementing Agreement with the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). Through this agreement, the City received its federal Endangered Species Act section 10(a) incidental take permit (PRT-830421) on July 18, 1997.

Pursuant to its MSCP permit, the City of San Diego has incidental "take" authority over 85 rare, threatened and endangered species. This means that the City may incidentally impact these species without additional state or federal approval or permits. This "take" authority is used by City departments for public projects and is also conferred to third parties (e.g., private developers) who receive City of San Diego development permits. Because "take" authority is granted locally, City and private development projects are spared the significant time and financial costs of state and federal wildlife agency permitting processes. In order to receive its MSCP take authority, the City agreed to carry out the obligations outlined in its Implementing Agreement. The City's primary MSCP obligations are:

- Preserve 52,012 acres within the City's MSCP planning area (total acreage was increased to 52,727 acres per R-300799 in conjunction with the City's brush management ordinance changes adopted on September 6, 2005);
- Ensure development project compliance with all City of San Diego MSCP implementing regulations (e.g., City of San Diego MSCP Subarea Plan, Environmentally Sensitive Lands Ordinance, Biology Guidelines, etc.);
- Annual reporting of habitat gains and losses to wildlife agencies;
- All rare plant, animal, habitat, and wildlife corridor biological monitoring as outlined in the 1996 *Biological Monitoring Plan for the Multiple Species Conservation Program* (1996);
- Biological monitoring results reporting to wildlife agencies on an annual basis;
- Preparation of area-specific management plans for lands preserved under the program; and
- Management of all lands preserved under the MSCP.
- Preparation and implementation of Area Specific Management Directives (ASMDs)
- Ensure development project compliance of specific conditions listed contained in Table 3-5 of the MSCP Subarea Plan .
- Management of lands conserved under the MSCP in accordance with the MSCP Subarea Plan and Implementing Agreement (IA).

Wildlife corridors have been identified as part of the regional planning effort for the MSCP. Future environmental analysis would be required for any discretionary actions needed to implement the Draft General Plan (such as community plan updates or amendments or individual project development proposals). Any identified impacts to wildlife movement could potentially be reduced to below a level of significance through the incorporation of mitigation measure Bio-3, which include features such as bridges and large culverts in order to minimize effects to wildlife movements. Additionally, because provisions in the MSCP Plan (**see Land Use discussion, 3.8**) requires that any modifications to the MHPA result in an overall benefit to the natural resources, it is anticipated that regional wildlife movement would be adequately protected. Since no specific projects have been identified, it is infeasible at this time to provide mitigation to a level that would result in impacts to below a level of significance. Therefore, these impacts are considered to be significant and unavoidable at this time.

Could implementation of the Draft General Plan affect the long-term conservation of biological resources by allowing encroachment by urban development into any defined comprehensive resource planning area (e.g., MHPA)?

The proposed Conservation Element of the General Plan Update contains policies to guide the conservation of resources that are consistent with existing environmental regulations, goals, and policies that address habitat, wildlife, natural open space, and natural drainages. These proposed policies would be consistent with the overarching MSCP goal to maintain and enhance biological diversity in the region and conserve viable populations of endangered, threatened, and key sensitive species and their habitats, while enabling economic growth in the region (**see Land Use discussion, section 3.8**). The proposal would also be consistent with the MHPA Land Use Adjacency Guidelines for drainage, toxics, lighting, noise, barriers, invasives and brush management, as identified in the MSCP Subarea Plan.

The City's MSCP designates areas suitable for development and areas proposed for conservation (MHPA). In the event that future growth is proposed within the MHPA, the MSCP Plan contains a provision that requires additional lands be added to the MHPA that have an equal or better biological value than those lands removed for development. Any modification to the adopted subarea plan would be subject to oversight by the USFWS, and CDFG, and would require environmental review and public comment pursuant to the California Environmental Quality Act (CEQA). Because existing provisions in the MSCP Plan require that any modifications to the plan result in equal or better biological values, the proposed Draft General Plan is not anticipated to result in any significant direct or indirect impacts on any environmental or habitat conservation plans.

Adoption of the proposed General Plan Update is not anticipated to have a significant impact on any defined comprehensive resource planning areas because the proposed goals and policies have been established to reduce impacts on sensitive biological resources and to be consistent with the City's MSCP and ESL ordinance. Additionally, any discretionary actions needed to implement the Draft General Plan) would be required to implement mitigation measure Bio-4 which would ensure consistency with the MHPA Land Use Adjacency Guidelines. Therefore, the proposed General Plan Update would not adversely affect the viability of any long-term conservation plans (e.g., MSCP).

Could implementation of the Draft General Plan result in a substantial adverse impact on wetlands (including, but not limited to, marsh, vernal pool, riparian, etc.) through direct removal, filling, hydrological interruption, or other means?

The ESL regulations require that impacts to wetlands be avoided. Unavoidable impacts should be minimized to the maximum extent practicable, and mitigated as follows:

As part of the project-specific environmental review pursuant to CEQA, all unavoidable wetlands impacts (both temporary and permanent) would need to be analyzed and mitigation would be required in accordance with **Table 3.3-4** of the Biology Guidelines; mitigation must be based on the impacted type of wetland habitat. Mitigation must prevent any net loss of wetland functions and values of the impacted wetland.

The following provides operational definitions of the four types of activities that constitute wetland mitigation under the ESL regulations:

Wetland creation is an activity that results in the formation of new wetlands in an upland area. An example is excavation of uplands adjacent to existing wetlands and the establishment of native wetland vegetation.

Wetland restoration is an activity that re-establishes the habitat functions of a former wetland. An example is the excavation of agricultural fill from historic wetlands and the re-establishment of native wetland vegetation.

Wetland enhancement is an activity that improves the self-sustaining habitat functions of an existing wetland. An example is removal of exotic species from existing riparian habitat.

Wetland acquisition is an activity resulting in wetland habitat that being bought or obtained through the purchase of off-site credits.

Wetland enhancement and wetland acquisition focus on the preservation or the improvement of existing wetland habitat and function, and do not result in an increase in wetland area; therefore, a net loss of wetland may result. As such, acquisition and/or enhancement of existing wetlands may be considered as partial mitigation only, for any balance of the remaining mitigation requirement after restoration or creation if wetland acreage is provided at a minimum of a 1:1 ratio. For permanent wetland impacts that are unavoidable and minimized to the maximum extent feasible, mitigation must consist of creation of new, in-kind habitat to the fullest extent possible and at the appropriate ratios. In addition, unavoidable impacts to wetlands located within the Coastal Overlay Zone must be mitigated on-site, if feasible. If on-site mitigation is not feasible, then at least a portion of the mitigation must occur within the same watershed. All mitigation for unavoidable wetland impacts within the Coastal Overlay Zone must occur within the Coastal Overlay Zone.

The MSCP Subarea Plans have policies protecting wetland habitat, although it is not the primary purpose of the subarea plans to provide a regional approach to the protection of wetlands. Additionally, many wetlands are regulated by the following agencies: ACOE, CDFG, and the California Coastal Commission. For the wetland sites under the jurisdiction of these agencies, these agencies have policies encouraging or mandating avoidance and minimization of impacts. If impacts do occur, no net loss of wetland functions or values would generally be permitted. This, in practice, often results in more wetlands created and/or restored than are impacted. Unavoidable significant impacts may occur to wetland habitats due to future development; however, federal, state and local agencies would require mitigation measures to ensure there is no net loss of wetland habitat. However, some aquatic resources are not protected by existing regulations.

Since no specific projects have been identified, it is infeasible at this time to provide mitigation to a level that would result in no net loss of wetland habitat. Therefore, these impacts are considered to be significant and unavoidable at this time.

Could implementation of the Draft General Plan result in a conflict with any local policies or ordinances protecting biological resources?

The MSCP is a conservation program designed to facilitate the implementation of a regional habitat preserve by coordinating project impacts and mitigation while allowing the issuance of "take" permits for sensitive upland species at the local level (City of San Diego 1997). This habitat preserve is known as the MHPA and lands within it have been designated for conservation. Various jurisdictions, including the City of San Diego, have developed MSCP Subarea plans to establish guidelines for the implementation of the their respective preserve areas which are included in the regional MHPA.

In addition to general guidelines and directives provided in the City's MSCP Subarea Plan, development in the City of San Diego is subject to restrictions discussed in the Land Development Code Biology Guidelines (2002) and the ESL ordinance. As discussed above under Threshold 1 and in the **Land Use section (3.8)**, the goals and policies of the Draft General Plan would be consistent with the MSCP, ESL, and the City's Biology Guidelines. Therefore, no significant impacts would result with adoption of the proposed Draft General Plan.

Could the revised Land Use Compatibility Chart proposed by the General Plan Update result in noise impacts to sensitive species?

No specific projects or actions have been identified with this proposal that would result in any direct or indirect physical change in the environment. However, future growth is anticipated and may occur on undeveloped land which may result in impacts to biological resources. Future environmental analysis would be required for any discretionary actions needed to implement the General Plan Update (such as community plan updates or amendments or individual project development proposals).

The increase in intensity of development can result in increased noise levels in certain areas. Additionally, increased noise from construction, roadway traffic or transit will also result in an increase in ambient noise. An increase in levels of noise has the potential to affect behavioral and physiological responses in noise-sensitive wildlife receptors. Adverse responses to increased noise may include hearing loss or the temporary masking of vocalizations commonly used during the breeding season, nest abandonment, and decrease in predator awareness, thereby resulting in a decrease in reproductive and overall fitness of certain animal species. Birds are considered to be the most noise-sensitive group of wildlife species in terrestrial ecosystems.

In accordance with the MSCP, uses in or adjacent to the MHPA should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas, recreational areas and any other use that may introduce noises that could impact or interfere with wildlife utilization of the MHPA. Potential noise mitigation measures consistent with the City's Biology Guidelines, MSCP and ESL have been identified under **Table 3.3.4**, in **Section 3.3.6**. All future projects (such as community plan updates or amendments or individual project development proposals) associated with the Draft General Plan would incorporate these mitigation measures, therefore, no significant, unmitigated impacts are anticipated to occur with adoption of the Draft General Plan.

3.3.4 Mitigation Framework

The following measures are currently applied to projects that impact biological resources.

As each future project is reviewed under CEQA, additional specificity may be required with respect to mitigation measures identified below. **These measures may be updated periodically in response to changes in federal and state laws, and new/improved scientific methods.**

- Development Projects shall be designed to minimize or eliminate impacts to natural habitats and known sensitive resources consistent with the City's Biology Guidelines, MSCP Subarea Plan, and the ESL ordinance.

- Biological mitigation for upland impacts shall be in accordance with the City's Biology Guidelines, **Table 3.3.4** as illustrated below. Prior to the commencement of any construction related activity on-site (including earthwork and fencing) and/or the preconstruction meeting, mitigation for direct impacts to Tier I, Tier II, Tier IIIA, and Tier IIIB shall be assured to the satisfaction of the Development Services Department Environmental Review Manager (ERM) through preservation of upland habitats in conformance with the City's Biology Guidelines, MSCP, and ESL Regulations. Mitigation for upland habitats may include on-site preservation, on-site enhancement/restoration; payment into the Habitat Acquisition Fund; acquisition/dedication of habitat inside or outside the MHPA; or other mitigation as approved by the ERM, MSCP staff and the Park and Recreation, as described below. Any restoration plans are subject to review by the City's EAS, Parks and Recreation and MSCP staff prior to issuance of any grading permits. These entities also must sign off on final acceptance of the mitigation project as successful.

- Development projects shall provide for continued wildlife movement through wildlife corridors as identified in the MSCP Subarea Plan or as identified through project-level analysis. Mitigation may include, but is not limited to, provision of appropriately-sized bridges, culverts, or other openings to allow wildlife movement.

Table 3.3-4
Upland Mitigation Ratios

TIER	HABITAT TYPE	MITIGATION RATIOS
TIER 1 (rare uplands)	Southern Foredunes Torrey Pines Forest Coastal Bluff Scrub Maritime Succulent Scrub Maritime Chaparral Scrub Oak Chaparral Native Grassland Oak Woodlands	Location of Preservation Location of Impact: Inside* — Inside 2:1, Outside 3:1 Location of Impact: Outside — Inside 1:1, Outside 2:1
TIER II (uncommon uplands)	Coastal Sage Scrub (CSS) CSS/Chaparral	Location of Preservation Location of Impact: Inside* — Inside 1:1, Outside 2:1 Location of Impact: Outside — Inside 1:1, Outside 1.5:1
TIER III A: (common uplands)	Mixed Chaparral Chamise Chaparral	Location of Preservation Location of Impact: Inside* — Inside ~~2:1~~ 1:1, Outside ~~3:1~~1.5:1 Location of Impact: Outside — Inside ~~1:1~~ 0.5:1, Outside ~~2:1~~1:1
TIER III B: (common uplands)	Non-Native Grasslands	Location of Preservation Location of Impact: Inside* — Inside 1:1, Outside 1.5:1 Location of Impact: Outside — Inside 0.5:1, Outside 1:1
TIER IV: (other uplands)	Disturbed Land Agriculture Eucalyptus Woodland Ornamental Plantings	Location of Preservation Location of Impact: Inside* — Inside 0:1, Outside 0:1 Location of Impact: Outside — Inside 0:1, Outside 0:1

Notes:

1. For all Tier I impacts, the mitigation could (1) occur within the MHPA portion of Tier I (in Tier) or (2) occur outside of the MHPA within the affected habitat type (in-kind)
2. For impacts to Tier II, III A and III B habitats, the mitigation could (1) occur within the MHPA portion of Tiers I – III (out-of-kind) or (2) occur outside of the MHPA within the affected habitat type (in-kind).

* No mitigation would be required for impacts within the base development area (25%) occurring inside the MHPA. Mitigation for any impacts from development in excess of the 25% base development area for community plan public facilities or for projects processed through the deviation process would be required at the indicated ratios.

- For all projects adjacent to the MHPA, the development shall conform to all applicable MHPA Land Use Adjacency Guidelines (Section 1.4.3) of the MSCP Subarea Plan. In particular, lighting, drainage, landscaping, grading, access, and noise must not adversely affect the MHPA. Prior to issuance of any authorization to proceed, the following shall occur:

- Lighting should be directed away from the MHPA, and shielded if necessary and a note shall be included on the plans to the satisfaction of the Environmental Review Manager (ERM).

- Drainage should be directed away from the MHPA, or if not possible, must not drain directly into the MHPA. Instead, runoff should flow into sedimentation basins, grassy swales or mechanical trapping devices prior to draining into the MHPA. Drainage shall be shown on the site plan and reviewed satisfactory to the City Engineer.

- The landscape plan shall be review and approved by the ERM to ensure that no invasive non-native plant species shall be planted in or adjacent to the MHPA.

- All manufactured slopes must be included within the development footprint and outside the MHPA.

- All brush management areas shall be shown on the site plan and reviewed and approved by the ERM Zone 1 brush management areas must be included within the development footprint and outside the MHPA. Brush management Zone 2 may be permitted within the MHPA (considered impact neutral) but cannot be used as mitigation.

- Access to the MHPA, if any, should be directed to minimize impacts and shall be shown on the site plan and reviewed and approved by the ERM

- The following mitigation measures reflect species specific noise attenuation requirements in relationship to Bio-5.

- Construction noise as it effects sensitive avian species: Schedule the construction of projects to avoid impacts to wildlife (e.g., avoid the breeding season for sensitive species) to the extent practicable. If avoidance of construction during the breeding season is not feasible project-specific review shall define specific mitigation measures, such as berms and sound walls, which would reduce construction and operational.

***COASTAL CALIFORNIA GNATCATCHER* (Federally Threatened) *LEAST BELL'S VIREO* (State Endangered/Federally Endangered), *SOUTHERN WILLOW FLYCATCHER* (*Federally Endangered*)**

Coastal California Gnatcatcher (Federally Threatened), least Bell's vireo (State Endangered/Federally Endangered), and Southwestern Willow Flycatcher Mitigation as outlined below shall be required for any grading or clearing activities in areas where there is potential to impact these species (Coastal California Gnatcatcher, -MHPA only). ~~,~~

Prior to the issuance of any authorization to proceed, the City's Environmental Review Manager (or appointed designee) shall verify that the Multi-Habitat Planning Area (MHPA) boundaries and the following project requirements regarding the coastal California gnatcatcher, least Bell's vireo, and Southwestern Willow Flycatcher are shown on the grading and building permit plans:

No clearing, grubbing, grading or other construction activities shall occur between March 1 and August 15, the breeding season of the coastal California gnatcatcher; between March 15 and September 15, the breeding season of the least Bell's vireo; and between May 1 and September 1, the breeding season of the Southwestern Willow Flycatcher, until the following requirements have been met to the satisfaction of the ADD of LDR.

- A qualified biologist (possessing a valid Endangered Species Act Section 10(a)(1)(A) Recovery Permit) shall survey habitat areas (only within the MHPA for gnatcatchers) that would be subject to the construction noise levels exceeding 60 decibels [dB(A)] hourly average for the presence of the coastal California gnatcatcher, least Bell's vireo, and the Southwestern Willow Flycatcher. Surveys for this species shall be conducted pursuant to the protocol survey guidelines established by the U.S. Fish and Wildlife Service within the breeding season prior to the commencement of construction. **If the coastal California gnatcatchers, least Bell's vireo, and/or the Southwestern Willow Flycatcher are present, then the following conditions must be met:**

  - Between March 1 and August 15 for occupied gnatcatcher habitat, between March 15 and August 15 for occupied least Bells vireo habitat, and between May 1 and September 1 for occupied Southwestern Willow Flycatcher habitat, no clearing, grubbing, or grading of occupied habitat shall be permitted. Areas restricted from such activities shall be staked or fenced under the supervision of a qualified biologist; **AND**

  - Between March 1 and August 15 for occupied gnatcatcher habitat, between March 15 and August 15 for occupied least Bells vireo habitat, and between May 1 and September 1 for occupied Southwestern Willow Flycatcher habitat, no construction activities shall occur within any portion of the site where construction activities would result in noise levels exceeding 60 dB (A) hourly average at the edge of the occupied habitat. An analysis showing that noise generated by construction activities would not exceed 60 dB (A) hourly average at the edge of occupied habitat must be completed by a qualified acoustician (possessing a current noise engineer license or registration with monitoring noise level experience with listed animal species) and approved by the ERM at least two weeks prior to the commencement of construction activities; **OR**

  - At least two weeks prior to the commencement of clearing, grubbing, grading and/or any construction activities, under the direction of a qualified acoustician, noise attenuation measures (e.g., berms, walls) shall be implemented to ensure that noise levels resulting from construction activities will not exceed 60 dB(A) hourly average at the edge of habitat occupied by the aforementioned avian species. Concurrent with the commencement of construction activities and the construction of necessary noise attenuation facilities, noise monitoring shall be conducted at the edge of the occupied habitat area to ensure that noise levels do not exceed 60 dB (A) hourly average. If the noise attenuation techniques implemented are determined to be inadequate by the qualified acoustician or biologist, then the associated construction activities shall cease until such time

that adequate noise attenuation is achieved or until the end of the appropriate breeding season.

✶ *Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB (A) hourly average or to the ambient noise level if it already exceeds 60 dB (A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the ERM, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.*

- If the aforementioned avian species are not detected during the protocol survey, the qualified biologist shall submit substantial evidence to the ERM and applicable resource agencies which demonstrate whether or not mitigation measures such as noise walls are necessary during the applicable breeding seasons of March 1 and August 15, March 15 and September 15, and May 1 and September 1, as follows:

  - If this evidence indicates the potential is high for the aforementioned avian species to be present based on historical records or site conditions, then Condition 1-b or 1-c shall be adhered to as specified above.

  - If this evidence concludes that no impacts to the species are anticipated, no new mitigation measures are necessary.

- If the permittee begins construction prior to the completion of the protocol avian surveys, then the Development Services Department shall assume that the appropriate avian species are present and all necessary protection and mitigation measures shall be required as described in 1 a, b, and c.

SENSITIVE AVIAN SPECIES

- If project grading is proposed during the raptor breeding season (Feb. 1-Sept. 15), the project biologist shall conduct a pregrading survey for active raptor nests in within 300ft. of the development area and submit a letter report to MMC prior to the preconstruction meeting.

- If active raptor nests are detected, the report shall include mitigation in conformance with the City's Biology Guidelines (i.e. appropriate buffers, monitoring schedules, etc.) to the satisfaction of the City's Environmental Review Manager (ERM)). Mitigation requirements determined by the project biologist and the ERM shall be incorporated into the project's Biological Construction Monitoring Exhibit (BCME) and monitoring results incorporated in to the final biological construction monitoring report.

- If no nesting raptors are detected during the pregrading survey, no mitigation is required.

- Post Construction and operational noise as it effects sensitive avian species: For development projects utilizing any stationary noise generators (i.e. air conditioning

units), a site- specific acoustical analysis shall be conducted by a qualified acoustician in order to determine noise attenuation measures, if necessary, in order to reduce noise levels exceeding 60 dB(A) at the edge of occupied habitat.

- The City's Biology Guidelines and MSCP Subarea Plan require that impacts to wetlands, including vernal pools, shall be avoided, and that a sufficient wetland buffer shall be maintained, as appropriate, to protect resource functions/values. For vernal pools, this includes avoidance of the watershed necessary for the continued viability of the ponding area. Where wetland impacts are unavoidable (determined case-by-case), they shall be minimized to the maximum extent practicable and fully mitigated per the Biology Guidelines. The biology report shall include an analysis of on-site wetlands (including City, state and federal jurisdiction analysis) and, if present, include project alternatives that fully/substantially avoid wetland impacts. Detailed evidence supporting why there is no feasible, less environmentally damaging location or alternative to avoid any impacts must be provided for City staff review, as well as a mitigation plan that specifically identifies how the project is to compensate for any unavoidable impacts. A conceptual mitigation program (which includes identification of the mitigation site) must be approved by City staff prior to the release of the draft environmental document. Avoidance is the first requirement; mitigation can only be used for impacts clearly demonstrated to be unavoidable.

- Limit the disturbance to native vegetation to the extent practicable. Revegetate with native plants where appropriate, and locate construction staging areas in previously disturbed areas.

RESOURCE AGENCY PERMITTING

Prior to the commencement of any construction related activities on-site for projects impacting wetland habitat (including earthwork and fencing) the applicant shall provide evidence[1] of the following to the ERM prior to any construction activity:

- Compliance with United States Army Corps of Engineers (ACOE) Section 404 nationwide permit;

- Compliance with the Regional Water Quality Control Board Section 401 Water Quality Certification; and

- Compliance with the CDFG Section 1601/1603 Streambed Alteration Agreement.

3.3.5 Significance of Impact with Mitigation Framework

No specific projects or actions have been identified with the Draft General Plan that would result in any direct or indirect physical change in the environment. However, future growth is anticipated and may occur on undeveloped land which may result in impacts to biological

[1]. Evidence shall include either copies of permits issued, letter of resolutions issued by the responsible agency documenting compliance, or other evidence documenting compliance and deemed acceptable by the ADD of LDR.

resources. Therefore, for the purposes of this impact analysis, it is assumed impacts to biological resources may occur with future actions, such as community plan updates or amendments or individual project development proposals, and potential mitigation measures consistent with the City's Biology Guidelines, MSCP and ESL would be implemented.

Future environmental analysis would be required for any discretionary actions needed to implement the Draft General Plan. As discussed above, such proposals may result in significant impacts and project specific mitigation would be required. However, at the program level of analysis, impacts are considered significant and unavoidable

Notes and References

City of San Diego.

1996 *Development Services Department, Environmental Analysis Section/Public Projects and USFWS. Recirculated Draft Joint EIR/EIS Issuance of Take Authorizations for Threatened and Endangered Species Due to Urban Growth Within the MSCP Planning Area. LDR No. 93-0287. SCH No. 93121073.* August.

1997 *City of San Diego Multiple Species Conservation Program (MSCP): Background and Requirements, Implementing Agreement, Endangered Species Act section 10(a) incidental take permit (PRT-830421)* July 1997.

1997 *Multiple Species Conservation Program Subarea Plan (Draft)* March 1997.

1998 *Multiple Species Conservation Program Subarea Plan (Final)* August 1998.

2002 *Biological Review References. July 2002.*

2003 *Development Services Department, Environmental Analysis Section. Final Program Environmental Impact Report Canyon Sewer Cleaning Program and Long-Term Sewer Maintenance Program. Project Number: 6020. SCH No. 2002041129.* December 2003.

2003 *Biological Resources Report. City of San Diego Program Environmental Impact Report Canyon Sewer Cleaning Program and Long-Term Sewer Maintenance Program.* June 2003 revised November 2003.

2007 *Development Services Department Significance Determination Thresholds* ~~SANDAG~~.

2004 *Final Program Environmental Impact Report for the Regional Comprehensive Plan for the San Diego Region.* - *SANDAG. SCH No. 2004011141. June 2004*

3.4 GEOLOGIC CONDITIONS

3.4.1 Existing Conditions

Geological Setting

The San Diego region is underlain by three principle geologic provinces. The majority of the county is in the Peninsular Ranges province bounded by the coastal province to the west and the Salton Trough province to the east. The western edge of the Peninsular Ranges province corresponds with the eastern hills and mountains along the edge of Poway, Lakeside, and El Cajon. Extending east of Julian and Jacumba, the province abruptly ends along a series of faults. To the north, the Peninsular Ranges province continues into the Los Angeles basin area; to the south it makes up the peninsula of Baja California.

As the Peninsular Ranges province experienced uplifting and tilting, a series of large faults, such as the Elsinore and San Jacinto, developed along the edge of the province. The eastern area "dropped" down, creating what is now known as the Salton Trough-Gulf of California depression. The Salton trough province, being lower than the surrounding landscape, became an area of deposition with sediments being carried to the depressed area by drainages of the peninsular ranges. Occasionally, the Salton Trough was inundated with marine waters from the Gulf of California, adding marine deposits to the sediment (Peterson, 1977).

The City of San Diego lies in the coastal plain province which extends from the western edge of the Peninsular Ranges and runs roughly parallel to the coastline. The province is composed of dissected, mesa-like terraces that graduate inland into rolling hills. The terrain is underlain by sedimentary rocks composed mainly of sandstone, shale, and conglomerate beds, reflecting the erosion of the Peninsular Ranges to the east.

Seismic Activity

Southern California is considered one of the most seismically active regions in the United States, with numerous active faults and a history of destructive earthquakes (County of San Diego, 1975). Earthquakes are caused by the release of accumulated strain along fractures in the earth's crust. Several earthquake fault zones, as well as numerous smaller faults, exist in the City of San Diego and in Southern California, as depicted on **Figure 3.4-1**. Since high-magnitude shocks transmit energy over large areas, fault zones outside the City's boundaries are included in this discussion.

The source of most earthquakes felt in San Diego is from the Imperial Valley, east of San Diego, and offshore fault systems (Lee, 1977). The Imperial Valley area is the most active source of local earthquakes and is the location of portions of the San Andreas, San Jacinto, and Elsinore faults. The San Andreas Fault, approximately 100 miles east of the City of San Diego, is outside the City and county limits but poses a potential hazard to the San Diego region. It extends a total of 650 miles from Baja California to the California coast north of San Francisco. In the vicinity

of the San Diego region, the San Andreas Fault follows the east side of Coachella and Imperial valleys. The nearest inhabited sections of the San Diego region are 30 miles away.

The San Jacinto fault is the largest of the active faults (faults that have moved in the last 11,000 years) in the San Diego region. The fault extends 125 miles from the Imperial Valley to San Bernardino. The maximum probable earthquake expected to occur along the San Jacinto fault would be a magnitude of 7.5 to 7.8 on the Richter scale. An earthquake of this magnitude would likely cause severe damage in nearby communities such as Borrego Springs and Ocotillo Wells, with the potential for moderate damage in the City of San Diego and coastal areas. Historical activity associated with the San Jacinto fault occurred in 1890, 1899, 1968, and 1979. The quake in 1968 had a recorded magnitude of 6.8 and was centered near Ocotillo Wells. The earthquake of 1979 was associated with a branch of the Imperial fault near the Mexican border and registered a magnitude of 6.4 on the Richter scale, causing extensive structural damage to Imperial Valley residences and businesses.

The Elsinore fault represents a serious earthquake hazard for most of the populated areas of the San Diego region. This fault is approximately 135 miles long, located approximately 40 miles north and east from Downtown San Diego. This fault can register earthquakes in the range of magnitude 6.9 to 7.0 on the Richter scale with an approximate recurrence interval of 100 years.

The Rose Canyon fault zone is an active offshore/onshore fault capable of generating an earthquake of magnitude 6.2 to 7.0 on the Richter scale. The fault zone lies partially offshore as part of the Newport/Inglewood fault zone and parallels the San Diego north county coastline within approximately two to six miles until coming ashore near La Jolla Shores. The onshore segment trends through Rose Canyon, through Old Town San Diego, and appears to die out in San Diego Bay (Abbott, 1989). Evidence of faulting in San Diego Bay is thought to be associated with this fault (county of San Diego, 1975). The fault zone is composed of a number of fault segments, including the Rose Canyon, Mount Soledad, and Country Club faults.

The La Nacion fault zone runs parallel to the Rose Canyon fault zone and San Diego Bay, approximately five miles inland from the bay. This fault is considered potentially active (county of San Diego, 1975).

The major offshore fault zones are the San Clemente, San Diego Trough, and Coronado Bank. The San Clemente fault zone, located 40 miles off La Jolla, is the largest offshore fault. It is estimated that the maximum plausible quake along this fault would be between magnitude 6.7 and 7.7 (Kern, 1988). An earthquake in 1951 registered 5.9 and was centered near the San Clemente fault (County of San Diego 1975). The San Diego Trough and Coronado Bank fault zones are capable of seismic events of magnitude 6.0 to 7.7 (Demere, 1997).

The location of the City of San Diego in close proximity to large earthquake faults increases the potential of earthquake damage to structures and potentially endangers the safety of the City's inhabitants. Damage to structures and improvements caused by a major earthquake will depend on the distance to the epicenter, the magnitude of the event, the underlying soil, and the quality of construction. The severity of an earthquake can be expressed in terms of both intensity and magnitude. The magnitude of an earthquake is measured by the amount of energy released at the

source of the quake. The Richter scale, developed in the 1930s for Southern California, is used to rapidly define earthquake size and estimate damage.

Table 3.4-1 describes the various hazards stemming from seismic activity in the City of San Diego. These seismic hazards include groundshaking, ground displacement, seismically induced settlement/subsidence, liquefaction, soil lurching, and tsunamis and seiches. **Figure 3.4-1** depicts areas of the City subject to the relative risk from various geotechnical forces described on **Table 3.4-1** below and slope failure described in the next section. The geotechnical and relative risk areas in the City are illustrated by the geographical inclusion of each area of the City into one of three risk areas: nominal to low, low to moderate, and moderate to high. The nominal to low category includes areas of the City with such geologic characteristics that may include: generally stable areas; level mesas underlain by terrace deposits and bedrock; favorable geologic structures; gently sloping terrain; and areas containing minor or no erosion potential. The low to moderate relative risk areas could include areas with such geologic characteristics as: possible or conjectured landslide areas; slide prone formations; unfavorable geologic structures such as Friars; level or sloping terrain; hydraulic fills; and/or local high erosion. The moderate to high relative risk areas could include such geologic conditions as: confirmed, known or highly suspected landslide areas; an active Alquist-Priolo fault zone; high erosion potential; steep bluffs; and/or unfavorable geologic structures. The categories illustrate the types of geotechnical risks that could be found in particular areas of the City and are not all inclusive of the geotechnical risks that may be present within a certain area. Additional analysis of geotechnical risks is required during the application review phase for development.

Soils and Slope Stability

Slope failure is the movement of soil and rock material downhill to a lower position. Landslides are the most common naturally occurring type of slope failure in San Diego. Block falls, slumps, and block glides are specific types of landslides. San Diego's landslides are commonly composite slides, a combination of block glides and slumps. Block falls are of concern primarily in coastal bluff areas (Ganus, 1977).

Earthquakes and their aftershocks can intensify or activate an unstable slope. Loosely and weakly consolidated soils, steepened slopes which are due to either human activities or natural causes, and saturated earth materials create a fragile situation easily affected by an earthquake. In the San Diego region, a major earthquake could cause the occurrence of landslides along sea cliffs, on mountain roadcuts, along the slopes of Palomar and Laguna Mountains, and in subdivisions where unprotected cut slopes occur in landslide-prone areas (county of San Diego, 1975).

Landslides in the San Diego region generally occur in sedimentary rocks such as sandstone, siltstone, mudstone, and claystone. When these fine-grained rocks are exposed to the erosional actions of air and water, they often turn into clay. Seams of saturated clays can be responsible for landslides even on gentle slopes.

Table 3.4-1
Seismic Hazards

Seismic Hazard	
Groundshaking	When a break or rapid relative displacement occurs along the two sides of a fault, the tearing and snapping of the earth's crust creates seismic waves which are felt as a shaking motion at the ground surfaces. The most useful measure of severity of groundshaking for planning purposes is the Modified Mercalli Intensity scale. This scale, ranging from Intensities I to XII, judges shaking severity by the amount of damage it produces. Intensity VII marks the point at which damage becomes significant. Intensity VIII and above correspond to severe damage and problems that are of great community concern. For comparison, the Rose Canyon Fault, capable of producing a 7.0 magnitude earthquake, would have an intensity of VII-IX. Intensity IX earthquakes are characterized by great damage to structures including collapse.
Ground Displacement	Ground displacement is characterized by slippage along the fault, or by surface soil rupture resulting from displacement in the underlying bedrock. Such displacement may be in any direction and can range from a fraction of an inch to tens of feet. In San Diego, exposures are generally poor and most faults are either potentially active or inactive. However, if ground displacement were to occur locally, it would most likely be on an existing fault. Failure of the ground beneath structures during an earthquake is a major contributor to damage and loss of life. Many structures would experience severe damage from foundation failures resulting from the loss of supporting soils during the earthquake.
Seismically Induced Settlement/ Subsidence	Settlement of the ground may come from fault movement, slope instability, and liquefaction and compaction of the soil at the site. Settlement is not necessarily destructive. It is usually differential settlement that damages structures. Differential or uneven settlement occurs when the subsoil at a site is of non-uniform depth, density, or character, and when the severity of shaking varies from one place to another.
Liquefaction	Liquefaction is a process by which water-saturated granular soils transform from a solid to a liquid state during strong groundshaking. Primary factors controlling development of liquefaction include intensity and duration of ground accelerations, characteristics of the subsurface soil, in situ stress conditions, and depth of groundwater. Sites underlain by relatively loose, saturated deposits of fill, such as those found along the San Diego Bay, Mission Valley, and Downtown San Diego are susceptible to liquefaction. Lateral spreading is a lateral ground movement that takes place when liquefaction occurs adjacent to a slope or open face. The loss of strength in the liquefied material near the base of a slope can result in a slope failure. These kinds of failure have occurred adjacent to rivers and streams and along waterfronts and beaches during seismic events.
Soil Lurching	Soil lurching is the movement of land at right angles to a cliff, stream bank, or embankment due to the rolling motion produced by the passage of surface waves. It can cause severe damage to buildings because of the formation of cracks in the ground surface. The effects of lurching are likely to be most significant near the edge of alluvial valleys or shores where the thickness of soft sediments varies appreciably under a structure.
Tsunamis and Seiches	A tsunami is a sea wave generated by a submarine earthquake, landslide, or volcanic action. A major tsunami from either of the latter two events is considered to be remote for the San Diego area. However, submarine earthquakes are common along the edge of the Pacific Ocean, and all of the Pacific coastal areas are therefore exposed to the potential hazard of tsunamis to a greater or lesser degree. A seiche is an earthquake-induced wave in a confined body of water, such as a lake, reservoir, or bay.

Bentonite clay is a component of many San Diego soils. It is expandable clay randomly interbedded with sandstone strata. The resistant beds of sandstone can assume a slick surface along with the heavy, waterlogged clays can "slide" down the unstable slope. A slope can be made potentially unstable by grading operations involving: (a) removing material from the bottom of the slope, thus, increasing the angle of the slope; (b) raising the height of the slope above the previous level; (c) saturating the slope with water from septic tank, gutter runoff, or diverted drainage from another part of the slope; or (d) adding fill to the top of the slope, creating additional weight (county of San Diego, 1973). In addition, earth-moving activities can reactivate an old slide.

Areas of the county which have experienced sliding are commonly underlain by the Ardath Shale, Friars, Mission Valley, San Diego, and Otay rock formations. The Ardath Shale Formation extends from Torrey Pines State Park to Mission Bay and is composed of Bentonite-rich clay (county of San Diego, 1973). The Friars Formation occurs from Mission Valley to beyond Rancho Bernardo. The formation is composed of expandable clays with properties similar to those of bentonite. The Mission Valley Formation is found from Mission Valley to Rancho Bernardo and consists of a mix of shale, bentonite, and sandstone (SDSU, 2004). The San Diego Formation occurs throughout the coastal mesas from Mission Valley southward to the Mexican border and consists of fine to medium sandstone. The Otay Formation is found in the southwestern portion of the San Diego region and is composed of slide-resistant sandstone with occasional thin interbedding of bentonite clay (county of San Diego, 1973).

Erosion

Erosion is defined as a combination of processes in which the materials of the earth's surface are loosened, dissolved, or worn away, and transported from one place to another by natural agents. There are two types of soil erosion: wind erosion and water erosion. Erosion potential in soils is influenced primarily by loose soil texture and steep slopes. Loose soils can be eroded by water or wind forces, whereas soils with high clay content are generally susceptible only to water erosion. The potential for erosion generally increases as a result of human activity, primarily through the development of structures and impervious surfaces and the removal of vegetative cover.

Because much of the City of San Diego is characterized as having slopes greater than 25 percent in grade, there are many areas subject to erosion. **Figure 3.16-1 (see Visual Effects section)** depicts areas of the City with such slopes. Development on slopes greater than 25 percent tends to require engineering applications, which act to reduce development potential.

Table 3.4-2 identifies and summarizes the principal geologic hazards within the City, which include landslides, coastal bluffs, and debris flow or mudslide prone areas.

Table 3.4-2
Geologic Hazards

Geologic Hazard	
Landslide and Slope Stability	Old landslides and landslide-prone formations are the principal non-seismic geologic hazards within the City. Conditions which should be considered in regard to slope instability include inclination, characteristics of the soil and rock orientation of the bedding, and the presence of groundwater. The causes of classic landslides start with the preexisting condition inherent within the rock body itself that can lead to failure. The actuators of landslides can be both natural events such as earthquakes, rainfall and erosion and human activities such as grading and filling. Some of the areas where landslides have occurred are: Otay Mesa; the east side of Point Loma; the vicinities of Mount Soledad, Rose Canyon, Sorrento Valley, and Torrey Pines; portions of Rancho Bernardo and Los Peñasquitos; and along Mission Gorge in the vicinity of the second San Diego Aqueduct.
Coastal Bluffs	Coastal bluffs are land features that have resulted from the actions of sea wave forces on geologic formations and soil deposits. Geologic factors that affect the stability of bluffs include rock type, jointing and fracturing, faulting and shear zones, and base erosion. Where bluffs are eroding quickly, measures to reduce bluff degradation may be necessary in order to preserve the bluff line. In the Torrey Pines area, the coastal bluffs have experienced sizeable landslides where oversteepening of the seacliff has resulted in unstable conditions. In addition, rock falls have occurred in the Sunset Cliffs area due to undermining of the sandstone.
Debris Flows or Mudslides	A debris flow or mudslide is a form of shallow landslide involving soils, rock, plants, and water forming a slurry that flows downhill. This type of earth movement can be very destructive to property and cause significant loss during periods of heavy rainfall. The City of San Diego is susceptible to mudslides due to abundant natural, hilly terrain and steep manufactured slopes. Steeply-graded slopes tend to be difficult to landscape and are often planted with shallow-rooted vegetation on a thin veneer of topsoil. When saturated, these loose soils behave like a liquid and fail.

Regulatory Setting

Administrative actions have been implemented by local, state and federal agencies to reduce the effects of such geologic hazards as earthquakes and landslides.

The City uses the San Diego Seismic Safety Study, a set of geologic hazard maps and associated tables, as a guideline to correlate the acceptable risk of various land uses with seismic (and geologic) conditions identified for the site. Large and complex structures, and places attracting large numbers of people, are the most restricted as to geographic location based on site conditions. These facilities include dams, bridges, emergency facilities, hospitals, schools, churches, and multistory office and residential structures. Low- and medium-density residential development is considered land use of a lesser sensitivity and is therefore "suitable" or "provisionally suitable" (requiring site stabilization) under most geologic conditions. Uses with only minor or accessory structures can be located on sites with relatively greater risk due to lower user intensity associated with activities such as parks and open space, agriculture, and most industrial land uses. Geotechnical investigations are required to be performed prior to site

development. The scope of investigations can range from feasibility surveys to extensive field exploration and engineering/geologic/seismic analyses depending upon the complexity of site conditions and the intensity of the proposed land use.

San Diego has been required to enforce the State Earthquake Protection Law (Riley Act of 1933) since its enactment in 1933. However, the seismic resistance requirements of the law were minimal for many years and San Diego did not embrace more restrictive seismic design standards until the adoption of the 1952 Uniform Building Code. Other applicable state regulations include the Alquist-Priolo Earthquake Fault Zoning Act of 1972, the Seismic Hazards Mapping Act of 1997, and the Unreinforced Masonry Law of 1986.

The California Earthquake Loss Reduction Plan was developed by the California Seismic Safety Commission in fulfillment of a mandate enacted by the Legislature in the California Earthquake Hazards Reduction Act of 1986. The plan is a comprehensive strategic document that sets forth the vision for a safer California and provides guiding policies. Incorporating lessons learned from all previous earthquakes, the plan is periodically updated for approximately five-year timeframes to continue to support new and ongoing efforts to protect California residents and the built environment. Such efforts are effective in reducing damage and injury from succeeding earthquakes. The City's development guidelines are consistent with state regulations and requirements.

Slope instability or erosion problems in the City are primarily regulated through the California Building Code (CBC) and the City's grading ordinance. The CBC requires special foundation engineering and investigation of soils on proposed development sites located in geologic hazard areas. These reports must demonstrate either that the hazard presented by the project will be eliminated or that there is no danger for the intended use. To reduce slide danger and erosion hazards, a grading permit must be obtained for all projects involving the process of moving soil and rock from one location to another. Grading ordinances are designed in part to assure that development in earthquake- or landslide-prone areas does not threaten human life or property. The CBC contains design and construction regulations pertaining to seismic safety for buildings (Bonneville and Huissain, 1997). These regulations cover issues such as the conversion of working stress to strength basis, ground motions, soil classifications, redundancy, drift and deformation compatibility, and designs of nonbuilding structures and nonstructural components. Recent improvements have been incorporated into the CBC in order to prevent structural collapse. One concept which has been utilized to improve upon conventional designs is that of increasing a structure's ductility, which is the ability of a structure to absorb energy. Another key concept is inelastic response, in which engineers calculate the maximum inelastic response displacement to determine a structure's drift and deformation compatibility with a seismic event. New soil profile classifications have also been adopted to ensure that structural designs are compatible with the soil subsurface on which they are constructed. While these regulations and improvements are intended to reduce the potential for loss of life, they cannot prevent all damage during a seismic event. However, these designs can greatly reduce the likelihood of a structural collapse during a seismic event.

Many of the City's most slide-prone or erosion-prone areas occur along the coastal bluffs which are within the jurisdiction of the California Coastal Commission. In addition to protecting

unique recreational and natural resources, the Coastal Commission requires the evaluation of the geologic hazards associated with coastal development. The local geologic background and potential for geologic impacts are important components of the San Diego Local Coastal Program, which guides development in the coastal zone.

3.4.2 Thresholds of Significance

A significant impact could occur if implementation of the Draft General Plan:

- Results in the exposure of people or property to geologic hazards such as groundshaking, fault rupture, landslides, mudslides, ground failure, or similar hazards.
- Results in a substantial increase in wind or water erosion of soils.
- Results in allowing structures to be located on a geological unit or soil that is unstable or that would become unstable and potentially result in on-site or off-site landslides, lateral spreading, subsidence, liquefaction or collapse.

3.4.3 Impact Analysis

Could implementation of the Draft General Plan result in the exposure of people or property to geologic hazards such as groundshaking, fault rupture, landslides, mudslides, ground failure, or similar hazards?

Seismic Activity

The entire San Diego region is susceptible to impacts from seismic activity, including earthquakes and ground-shaking events. Numerous active faults are known to exist in the City and region that could potentially generate seismic events capable of significantly affecting existing and proposed development. The Draft General Plan calls for future growth to be focused in compact, mixed-use activity areas. As the Draft General Plan is implemented over time in association with community plans and regulations, the associated development may result in an increase in the number of people and buildings exposed to seismic ground-shaking. Potential effects from surface rupture and severe groundshaking could cause damage ranging from minor to catastrophic. Groundshaking could also cause secondary geologic hazards such as slope failures and seismically-induced settlement. This is considered a potentially significant impact.

Although seismic activity can cause damage to substandard construction, new designs can substantially reduce potential damage. Earthquake-resistant designs employed on new structures reduce the risk to public safety from seismic events. All proposed development projects are required to adhere to design standards, grading, and construction practices to avoid or reduce geologic hazards. Regulatory agencies with oversight of development associated with the Draft General Plan apply regulations and engineering design specifications to consider and compensate for site-level geologic and seismic conditions.

Numerous structures throughout the City pre-date the most recent and more stringent seismic and geologic regulations currently in place, and expose people to increased risk. Although the City maintains regulations to identify potential hazards from unreinforced masonry bearing wall buildings, the regulations are largely voluntary and exempt many residential structures. Until those structures are replaced or substantially rehabilitated, existing risks from seismic and geologic hazards will remain.

The Draft General Plan contains policies in the Public Facilities, Services and Safety Element which address geologic hazards. These policies call for maintaining geologic hazard narrative and mapped information, adhering to state laws for seismic and geologic hazards, abating structures that present dangers during seismic events, and consultation with qualified geologists and seismologists on development projects.

Proposals for development are required to be reviewed by appropriate regulatory agencies prior to construction. Developments that occur in the City of San Diego are required to meet design standards that address seismically active areas and comply with the CBC. Mitigation measures would reduce the risks associated with seismic activity. However, since the Draft General Plan does not include specific development projects, it is infeasible at the Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level. Therefore, there is potential for a significant and unavoidable impact associated with seismic activity.

Slope Failure

Slope failure results in landslides and mudslides from unstable soils or geologic units. Given that future development would occur in the course of implementing the Draft General Plan, it is anticipated that some of this development would be constructed on geologic formations susceptible to slope failure, thereby increasing the risk to people and structures. This is considered a potentially significant impact. However, site-specific geotechnical investigations would be required prior to construction in order to properly design any proposed development. Additionally, all projects are required to adhere to state of California design standards and all standard design, grading, and construction practices to avoid or reduce geologic hazards.

In addition, regulatory agencies with oversight of development within the City of San Diego have regulations and engineering design specifications to address and compensate for site-level geologic and seismic conditions. All site designs must be reviewed and approved by the appropriate agencies. Mitigation measures would reduce the risks associated with slope failure. However, since the Draft General Plan does not include specific development projects, it is infeasible at the Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level. Therefore, there is potential for a significant and unavoidable impact associated with slope failure.

Could implementation of the Draft General Plan result in a substantial increase in wind or water erosion of soils?

High erosion potential in soils is primarily caused by loose soils and steep slopes. The potential for erosion generally increases as a result of human activity, primarily through the development

of structures and impervious surfaces and the removal of vegetative cover. As stated above, future development will occur through implementation of the Draft General Plan. Future development that is on or in proximity to areas with steep slopes could increase erosion potential. Adherence to the City's grading ordinance would reduce potential impacts. However, since the Draft General Plan does not include specific development projects, it is infeasible at the Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level. Therefore, there is potential for a significant and unavoidable impact associated with erosion.

Could implementation of the Draft General Plan result in allowing structures to be located on a geological unit or soil that is unstable or that would become unstable and potentially result in on-site or off-site landslides, lateral spreading, subsidence, liquefaction or collapse?

Future development may be proposed in areas prone to landslides or where soil limitations (i.e. those prone to liquefaction, subsidence, collapse, etc.) present a hazard to people. This is considered a potentially significant impact. Implementation of mitigation measures would reduce potential impacts. However, since the Draft General Plan does not include specific development projects, it is infeasible at the Program EIR level to provide specific mitigation that would reduce impacts to a less than significant level. Therefore, there is potential for a significant and unavoidable impact associated with unstable geology and soils.

3.4.4 Mitigation Framework

Adherence to regulations and engineering design specifications are generally considered to preclude significant geologic impacts, and no mitigation is proposed at this program level of review. Goals, policies, and recommendations enacted by the City combined with the federal state and local regulations described above provide a framework for developing project level measures for future projects. Through the City's project review process compliance with standards is required of all projects and is not considered to be mitigation. However, it is possible that for certain projects, adherence to the regulations may not adequately protect against geologic impacts and such projects would require additional measures to avoid or reduce impacts. These additional measures would be considered for each future project requiring mitigation (i.e., measures that go beyond what is required by existing regulations).

Site-specific measures will be identified that reduce significant project-level impacts to less than significant, or the project level impact may remain significant and unavoidable where no feasible mitigation exists. Where mitigation is determined to be necessary and feasible, these measures will be included in a Mitigation Monitoring and Reporting Program (MMRP) for the project. These measures may be updated, expanded and refined when applied to specific future projects based on project-specific design and changes in existing conditions, and local, state and federal laws. General measures that may be implemented to preclude or reduce impacts include:

- Preparation of soil and geologic conditions surveys to determine site specific impacts and mitigation designed to mitigate survey recommendations;

- Implementation of state seismic and structural design requirements;

- Implementation of regulations designed to minimize erosion of cliffs, hillsides, and shorelines during and after construction; and

- Innovative grading techniques that reduce landslide and erosion hazard impacts to a greater degree than typically achieved through implementation of grading regulations.

3.4.5 Significance of Impact with Mitigation Framework

Since the Draft General Plan does not include specific development projects, it is infeasible at the Program EIR level to provide specific mitigation that would reduce any future impacts to a less than significant level. Therefore, at this program level of review, significant and unavoidable impacts associated with seismic and geologic hazards, erosion, and unstable geology and soils remains.

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